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Readiness to Learn, Child Development and Learning Outcomes: Background

T-98-4E.a

by

The Applied Research Branch

September 1998

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Abstract

In September of 1997, the Speech from the Throne stated the Canadian government's intention "to measure and report on the readiness to learn of Canadian children so that we can assess our progress made in providing our children with the best possible start." The Applied Research Branch (ARB) of Human Resources Development Canada is developing a program of research to study child development and learning using the National Longitudinal Survey of Children and Youth. Existing research tends to be restricted to specific cognitive and linguistic abilities thought to be indicative of readiness for school. Readiness to learn, however, is a much broader concept, encompassing learning in formal and informal settings. Its dimensions include learning outcomes, what the child brings to learning, and the child's life experiences. The focus of the ARB program will be on the child and the way the child learns, in the context of child development.

This document, with the overall title, Readiness to Learn, Child Development and Learning Outcomes, published in two volumes (as follows), forms the basis for the Applied Research Branch program on readiness to learn.

Readiness to Learn, Child Development and Learning Outcomes

T-98-4E.a: Background

T-98-4E.b: Potential Measures of Readiness to Learn

The first volume is divided into three parts. Part I, the "Annotated Bibliography," focuses on the definition of readiness to learn as well as conceptual models. Other relevant materials discovered during the literature search are also listed and include indicators of readiness, environmental influences, assessments, solutions, and early childhood programming.

The second part of *Background*, titled "Issues for the Development of the Measurement Instruments," examines the relevant issues from the perspective of ARB's needs. The objective of the study is the gathering of data, empirical evidence, and information for public policy development in support of ensuring that children are ready to learn and become learners for optimum human development. Part II addresses separately the interrelated issues of policy development and data collection. Policy development issues include the goal and focus of the program, the ambiguity of certain terms and concepts along with competing theories, learning outcomes, and requirements for evidence-based policy for human development. Policy development issues also cover age-appropriate measurements and cultural and intellectual diversity. This "Issues" section points out the need to focus on all Canadian children rather than just those at risk or experiencing difficulties. Data collection issues involve the consideration of a specific or inclusive model, longitudinal data collection, data sources and instruments, accuracy of measures, use of proxies, comparability of data and potential data on learning disorders.

Part III, "The Framework for Data Collection and Research on Child Development and Learning," was developed to guide the data, research and policy strategy for ARB. This discussion attempts to resolve several issues raised previously and to suggest a model for data collection and research. ARB's policy objectives for the work on readiness to learn are outlined:

they include monitoring the status of readiness to learn, and providing knowledge through empirical research for appropriate policy intervention in support of learning and human development. Learning is broadly defined and the focus is on how each child learns, in the context of development. ARB's strategy for research on child development and learning is discussed.

The companion volume to the three-part *Background*, called *Potential Measures of Readiness to Learn* (T-98-4E.b), is a chart of possible assessments of children based on the framework. It is designed to be a starting point for the consideration of measures of readiness to learn within the context of the existing National Longitudinal Survey of Children and Youth. The focus of the chart is on direct child measures of development and learning outcomes. Measures of the child's family, school and community will be considered separately.

Résumé

En septembre 1997, le discours du Trône annonçait que le gouvernement canadien «mesurera la maturité scolaire de nos enfants et fera des rapports périodiques qui permettront d'évaluer les progrès accomplis pour leur donner les meilleures chances de départ dans la vie». La Direction générale de la recherche appliquée (DGRA) de Développement des ressources humaines Canada élabore actuellement un programme de recherche dont l'objectif est d'étudier le développement des enfants et l'apprentissage chez ces derniers, d'après l'Enquête longitudinale nationale sur les enfants et les jeunes. Les études existantes tendent à se limiter à des aptitudes cognitives et linguistiques particulières qui sont considérées comme des indicateurs de la préparation à l'école. Toutefois, la maturité scolaire est un concept beaucoup plus vaste, qui englobe l'apprentissage dans des cadres structurés ou pas. Ses dimensions comprennent les résultats de l'apprentissage, ce que l'enfant apporte à l'apprentissage, de même que les expériences de vie de l'enfant. Le programme de la DGRA sera axé sur l'enfant et la façon dont il apprend, dans le contexte de son développement.

Le document de recherche intitulé «Readiness to Learn, Child Development and Learning Outcomes», publié en deux volumes (dont les titres suivent), sert de base au programme de la Direction générale de la recherche appliquée sur la maturité scolaire.

> Readiness to Learn, Child Development and Learning Outcomes (document sur la maturité scolaire, le développement des enfants et les résultats de l'apprentissage)
>
> T-98-4E.a : Background (volume sur le contexte)
>
> T-98-4E.b : Potential Measures of Readiness to Learn (volume sur les mesures possibles de la maturité scolaire)

Le premier volume est divisé en trois parties. La première partie, soit la bibliographie annotée, est axée sur la définition de la maturité scolaire et sur les modèles conceptuels. On y énumère aussi d'autres ouvrages pertinents relevés au cours de la recherche documentaire, qui portent notamment sur les indicateurs de la maturité, les facteurs environnementaux d'influence, les évaluations, les solutions et les programmes de la petite enfance.

La deuxième partie du premier volume traite des questions relatives à l'élaboration des instruments de mesure, du point de vue des besoins de la DGRA. L'étude a pour objet la collecte de données, de preuves empiriques et de renseignements à partir desquels élaborer des politiques publiques qui contribuent à faire en sorte que les enfants soient prêts à apprendre et que leur apprentissage favorise un développement humain optimal. Cette deuxième partie est divisée en deux sections consacrées aux questions interreliées touchant l'élaboration des politiques et la collecte des données. Au nombre des questions relatives à l'élaboration des politiques figurent le but et l'orientation du programme, l'ambiguïté de certains termes et concepts, de même que les théories contradictoires, les résultats de l'apprentissage et le besoin de politiques sur le développement humain fondées sur des données probantes. Elles englobent aussi des mesures en fonction de l'âge, de même que la diversité culturelle et intellectuelle. La section des questions fait ressortir la nécessité de mettre l'accent sur tous les enfants canadiens et non simplement ceux qui présentent des risques ou qui éprouvent des difficultés. Les questions relatives à la collecte

des données comprennent l'examen d'un modèle restreint ou intégré, la collecte de données longitudinales, les sources de données et les instruments de collecte, l'exactitude des mesures, l'utilisation d'approximations, la comparabilité des données et des données éventuelles sur les troubles d'apprentissage.

La troisième partie, soit le cadre de collecte des données et de recherche, a pour but d'orienter la stratégie de la DGRA en ce qui a trait aux données, à la recherche et à l'élaboration de politiques. On tente de régler plusieurs questions soulevées précédemment et on suggère un modèle de collecte des données et de recherche. Les objectifs stratégiques des travaux de la DGRA sur la maturité scolaire sont énoncés : suivre de près l'état de la maturité scolaire et, par des études empiriques, apporter des connaissances en vue d'interventions stratégiques appropriées favorisant l'apprentissage et le développement humain. Une définition générale de l'apprentissage est donnée, et l'accent est mis sur la façon dont chaque enfant apprend, dans le contexte du développement. Il est question de la stratégie de recherche de la DGRA sur le développement des enfants et l'apprentissage chez ces derniers.

Le premier volume en trois parties est accompagné d'un second volume (T-98-4E.b), qui présente sous forme de tableau des évaluations possibles des enfants d'après le cadre de collecte des données et de recherche. Ce tableau se veut le point de départ de l'examen des mesures de la maturité scolaire dans le contexte de l'actuelle Enquête longitudinale nationale sur les enfants et les jeunes. Ce tableau est axé sur des mesures directes du développement des enfants et des résultats de leur apprentissage. Les mesures relatives à la famille, à l'école et à la collectivité de l'enfant seront examinées séparément.

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Part I
An Annotated Bibliography

1. Introduction

The Applied Research Branch of Human Resources Development Canada is developing a program of work to assess child development and learning, using the National Longitudinal Survey of Children and Youth. In September 1997, the Speech from the Throne included the intention "to measure and report on the readiness to learn of Canadian children so that we can assess our progress in providing our children with the best possible start". Included among the steps taken to determine the requirements for data, research and policy, is this annotated bibliography. Two other parts of this paper — " Issues for the Development of the Measurement Instruments" and "Framework for Data Collection and Research on Child Development and Learning" — were developed based on previous commissioned work as well as this annotated bibliography.

The focus of this bibliography is the definition of readiness to learn and conceptual models. As material on other aspects of readiness to learn was identified during the literature search, some of it has been included in this bibliography. These other sections are not comprehensive. Key words are identified for each bibliographic entry. The annotation is presented in the most relevant section.

2. Overview Based on the Literature Review

The majority of the research thus far regarding readiness to learn is based on the concept of readiness for school and is mostly American. However, readiness for school cannot be equated with readiness to learn. Kagan's (1992) definitions of school readiness and readiness to learn are the most widely accepted (Crnic & Lamberty, 1994). Kagan defines readiness to learn as the level of development at which an individual is ready to undertake the learning of specific material. Often it includes attention, motivation, health, emotional maturity, intellectual ability, and developmental status. Readiness for school, in contrast, is defined as specific cognitive and linguistic skills such as identifying colours, copying a figure, and counting. It usually limits itself to children entering kindergarten or grade one. Another term, maturational readiness, refers to a fixed standard which children should attain prior to school entry but it also acknowledges that children need to develop according to their own internal time clocks (Kagan, 1992; Lewitt & Schurmann Baker, 1995). Learning in general in the school context is defined as an interactional process between two people where the learner incorporates new information from the instructor (Perry, Woolley, & Ifcher, 1995). Parents view readiness as performance on typical academic tasks such as recognition and use of letters, numbers, time, and colours. They also view co-operation and respect as essential (Holloway, Rambaud, Fuller, & Eggers-Pierola, 1995). Teachers view readiness as a combination of social interaction skills, the ability to follow directions, conduct, and self-help skills that increase "teachability". Physical health, persistence, activity, and distractibility are also seen as connected to readiness (Meisels, 1998; Schoen & Nagle, 1994).

Graue (1992) notes the social aspect of readiness. Through three case studies, it was seen that the nature of the community and the social class of the parents changed the way that readiness was viewed in the community. Isolated communities tended to see school as a chance for social interaction and learning and thus being ready for school was a function of age. It was seen as the teacher's job to adapt to the child's levels. Lower class families generally held a similar view while upper and middle class families, who were concerned about their child's ranking compared to the other children, tended to focus more on their child's academic and social readiness for school. This distinction between the classes with regards to readiness has been noted in a number of other studies as well (Liu & Brinlee, 1983; Holloway et al., 1995). This distinction may be

due to the fact that the lower class sees learning as a step to a career while the middle class values learning for its own sake (Holloway et al., 1995). Generally, studies of children and their readiness to learn tend to concentrate on studying the child in isolation although many case studies have demonstrated the vast differences in classroom climates and the skills necessary for that classroom (Graue, 1992; Meisels et al, 1997).

Many different theories have emerged with regards to readiness to learn. Some theories are maturational in design believing that readiness is innate. The idealist/nativist theorists believe that children are ready to learn when they reach certain biological milestones (Meisels, 1998). The socio-theory states that learning readiness is present in all children, since they can all legitimately participate...in some meaningful community activity (Volpe, Peterson-Badali, Corter, Case, & Biemiller, 1994, p.45). Other theories depend on the assumption that readiness is impacted solely by the environment in which one participates. The empiricist/environmentalists believe that readiness is controlled by the external environment (Meisels, 1998). The empiricists believe that learning readiness depends on the mastery of elementary patterns, concepts, and skills on which more complex patterns and pattern-processing is dependent (Volpe et al., 1994, p. 31). The social constructivist theory states that readiness is a set of meanings constructed by people in communities (Meisels, 1998). Other theories focus on both the child and the environment. The rationalist perspective states that "learning readiness depends on the level of structure that children have constructed in a domain, which in turn depends on the broad range of activities in which they have engaged" (Volpe, 1994, p.38). The interactionist perspective states that readiness is relative and bi-directional as it depends on the child's skills, knowledge and abilities as well as the conditions of the environment (Meisels, 1998). Initiatives which combine these perspectives have been found to be the most successful.

The degree to which a child is ready to learn is dependent upon a number of factors. The most prevalent of these being nutrition and health, parental involvement, and preschool education (Boyer, 1991; Brewerton, 1997; Kagan, 1992; National Governor's Association, 1997). A responsive workplace, television as a teacher, neighbourhoods for learning, and connections across the generations are also important (Boyer, 1991). Nutrition affects growth, development, health, and one's ability to learn. Good nutrition helps children benefit from mental and physical training and education. Poor nutrition results in increased illness, and decreased attention, independence, curiosity, and concentration (Parker, 1989). Parental involvement at an early age

and the fostering of secure attachment to caring adults are the key to later development and readiness for learning (Keating, 1998; National Governor's Association; Doherty, 1997). Effective preschool programs should foster the child's well being, sense of belonging, contribution, and communication. As well, they should offer many opportunities for exploration (Brewerton, 1997). The positive effects of preschool education include a reduction in special education and grade retention, increased parental aspirations for their children, positive effects for IQ, greater achievement orientation, and better outcomes after high-school. These effects may be tied to the increase in parental involvement stimulated by these programs (Entwisle, date unknown). In cultures where poverty prevails, the lack of materials for learning and play at home in the early years may be a significant factor in how ready to learn the children are (Liddell & McConville, 1994).

In the past, the assessment of a child's readiness for school has been used to refuse school entry, place the child in special classes, and hold the child in kindergarten an extra year, particularly in the United States. Research now shows the negative consequences of such actions: the use of transition rooms or grade retention in the early years have been found to be largely ineffective as no intervention is provided (Gredler, 1991; Karweit, 1987). Programs which emphasise processing strategies, blend behavioural facets, analyse learning strategies, use a systematic approach to instruction, and allow for individual variation are the most effective (Gredler, 1992; Karweit, 1987). Even if the resultant program is found to be effective, there are many problems inherent in the types of assessment tools currently in use. In addition, many of the tests have not been proven to have high predictive validity for future learning (Crnic & Lamberty, 1990; Gredler, 1992).

The three main types of tests used to measure readiness include developmental screening measures, readiness tests, and performance assessments. Developmental screening measures are those which measure one's potential to acquire skills (Gredler, 1997). Examples include the Pediatric Examination of Educational Readiness (PEER), the Gesell, the Brigance, The Comprehensive Test of Basic Skills, the Stanford Early School Achievement Test, the Iowa Tests of Basic Skills; the Metropolitan Achievement Test and the Developmental Indicators for the Assessment of Learning (Dial-R) (Gredler, 1997; Meisels et al., 1997; Palmer, Garner, Lifschitz, Wilson, & Wiliamson, 1990; Williams & Wilkins, 1993). Although these are the most widely used tests, fewer than half of teachers follow the expected test procedures, which leads to

invalid results; the scores often indicate reading readiness rather than learning readiness, due to the strong language focus of the tests; and the skills are tested outside of their regular context (Meisels et al., 1997).

Readiness tests measure learning tasks such as motor co-ordination, memory, verbal expression, language, comprehension, and social emotional status (Gredler, 1997). Examples include the Early Screening Inventory, Developmental Tests for Kindergarten Readiness, Brigance K and 1 Screen, Metropolitan Readiness Tests, Gesell School Readiness Test and the Denver II (Gredler, 1997). Although these tests are widely used and can easily be used to make comparisons and judgements they have a number of disadvantages: fewer than one out of ten tests are administered correctly; many have middle class biases; the focus is solely on the child and not on the child's fit with the classroom; many have low reliability, validity, or standardisation data or lack this information entirely; the tests do not report sensitivity and specificity; and their content is generally abstract, and verbally-mediated (Meisels et al., 1997).

Performance Assessments are an evaluation of an individual student's performance based on a teacher's decision about the curriculum. They aim to measure a child's grasp of concepts and transferable skills by observing over time and in numerous instances a child's grasp of a certain skill. Performance assessments reinstate the teaching of higher-order thinking skills, make assessment relevant to instruction, are interactive, encourage meta-cognition, are situated within the learning context, and are guided by developmental standards. However, the individual focus of the test poses difficulties in standardization, reliability, and validity (Meisels et al., 1997). Due to the areas found to have the greatest impact on student learning (see Wang, 1993), performance assessments would be the best alternative for measuring readiness of individual children (Meisels et al., 1997). Some authors note that caution should be used when assessing young children at all as children in this age range have a high degree of behavioural instability (Gredler, 1992).

Readiness has also been assessed using developmental age. Developmental age is defined as the progress of the child through predictable stages (Butaine & Costenbader, 1997). de Lemos & Mellor (1991) found that parent and teacher ratings of readiness for school are comparable to scores obtained from developmental tests such as Piaget and Inhelder's scale of children's development based on the ability to draw and copy shapes. However, parents rated their children as more ready than the teachers did. Other methods used to predict school readiness include

looking at children's drawings (Roy, Williams, & Boydston) or analysing a child's temperament (Schoen & Nagle, 1994). Some researchers feel that one should measure learning potential, not knowledge already gained. Learning potential is defined as "one's ability to learn from experience after having received assistance to a task and transfer this learning to performance" (Jourdan-Ionescu & Coutune, 1996, p.3). This method also eliminates some of the bias against the lower class and may be more representative of "readiness to learn" as opposed to "school readiness."

In conclusion, the terms "school readiness" and "readiness to learn" are not well defined in the literature although definitions are beginning to emerge. There is a general trend towards focusing on readiness to learn rather than school readiness. One needs to consider the social environment when talking about readiness within a community. The current methods of measuring readiness may not be adequate but are widely used to make many important decisions. New methods of measuring and analysing readiness may need to be developed (such as performance assessments).

3. Definitions / Conceptual Models

Crnic, K., & Lamberty, G. (1994). Reconsidering school readiness: conceptual and applied perspectives. *Early Education and Development*, 5(2), 91-105.

Key Words: definition/ conceptual models, assessment, USA

Although school readiness implies a fairly fixed standard of physical, social, and intellectual development, the lack of a clear conceptual definition and the dependence on the kindergarten curriculum for that definition have impeded the construction of a clear definition. In addition one must distinguish between readiness to learn and readiness for school. In this paper, Kagan (1990)'s definitions (based on the maturationalist theory) have been adopted. *Readiness to learn* is defined as "the level at which the individual has the capacity to undertake learning specific subject matter" (p.95). It varies according to the fluidity of the multiple developmental processes. *Readiness for school*, in contrast, is the "belief that a specific set of cognitive, linguistic, social, and motor skills must be attained to indicate readiness" (p.95). Those who have not obtained the certain set of skills regardless of their intellectual abilities or chronological abilities should not be admitted to the classroom.

Tests of readiness for school using this approach generally focus on cognitive abilities, perceptual-visual skills, linguistic abilities (both comprehension and expression), and fine motor skills. In the United States in the early 1990's, between 10 and 50% of the children eligible chronologically to enter school, did not indeed enter school because of their scores on school readiness tests. However, school readiness scores are not proven to be correlated to later academic success. In addition, children's behaviour and abilities fluctuate frequently. Learning often occurs in bursts. Thus, single assessments may not be accurate of the child's potential.

Given the volatile nature of school readiness we should (1) assess the inequalities early in life so all children have the opportunity for educational success; (2) recognize and support individual differences in children; (3) establish reasonable expectations of children's abilities at school entry. Greater attention must be focused on the family's role in promoting readiness. Educational services should be individualized so that the responsibility for school readiness rests within the school. The impact of health concerns and brain functioning on school readiness should be

examined. In addition the following factors should be considered as part of school readiness: self regulatory behaviours, self-understanding, social relationships within the peer group, and affective behaviour. The child's early years or preschool experience should also be considered. Cross-cultural and racial issues should also be considered.

Doherty, G. (1997). *Zero to Six: The Basis for School Readiness.* Hull, Quebec: Applied Research Branch, Human Resources Development Canada.

Key Words: definitions/ conceptual models, indicators of readiness, Canada

Gillian Doherty was asked to look at the domains or characteristics within a child that allow the child, at age 5 or 6, to be ready to start school and take advantage of the learning opportunities offered there. She was also asked to explain why and how the first six years of a child's life are so important for laying the foundation for successful school adjustment and later adult competence. Doherty indicates that "readiness to learn" is a general concept that can be applied at any time in a person's life; indeed a child is born ready to learn. In contrast, the focus in the paper is "school readiness": the child's ability to meet the task demands of school - for example, being able to sit quietly and listen to the teacher, to control a pencil, and to assimilate the curriculum. The child must also be ready to be respectful of others, to be able to communicate and to understand what is communicated.

Doherty draws on the work of the United States National Education Goals Panel (see below) and identifies five domains of school or learning readiness within the child:

1) Physical well-being and motor development
2) Emotional health and a positive approach to new experiences
3) Social knowledge and competence
4) Language skills
5) General knowledge and cognitive skills

This developmental view of readiness goes well beyond the traditional idea that only cognitive and language skills are needed to have a successful start in school. Furthermore, this view includes the building blocks or sequential stages of development and, in the early years, the

specific times, or windows of opportunity, when a child is developmentally ready for more advanced skills given the appropriate environmental stimulation from parents and siblings, child care providers, or peers. These windows of opportunity, or critical periods, set the stage for later development. Lastly, a child's family, other care givers, and peers are important parts of his or her environment. Interactions between the child and these significant others are key determinants of the child's readiness for school.

Graue, M. E. (1992). Social interpretations of readiness. *Early Childhood Research Quarterly*, 7, 225-243.

Key Words: definitions/ conceptual models, environmental influences, USA

This article examines the topic of readiness for school as a social concept which is constructed by those who work with kindergarten children. In their day-to-day interactions individuals work together to construct meanings which are shared to various degrees. In this article, readiness for school is defined as "a level of maturity or skills that anticipates...success in the school setting" (p.225). Readiness may be viewed as maturation, or a biological unfolding of psychomotor and cognitive structures. It may also be viewed as a consequence of one's experience and skills. In order to examine the meaning of readiness, three distinct communities (Fulton, Norwood, and Rochester) were studied during the 1989-1990 school year. Observations of the school and classroom, discussions with the teachers, and interviews with the parents before and during the school year were used. In addition school records were used to supplement this information.

Fulton. Fulton served children from three rural towns in the Rocky Mountains. The families recognized the isolation in the area and looked forward to school as a time of socialization for their children. They viewed school as the place where fundamental skills would be developed. The teacher adopted instruction to the children's level and based the curriculum on their needs. Readiness was thus seen as an instructional level.

Norwood. Norwood served a middle-class suburban neighbourhood. The parents talked extensively of readiness and how their children would adapt to the school setting. Age was the primary concern with regards to readiness. However, no parent wanted their child to be the youngest in the group and evaluated their child in comparison to the other possible kindergarten students. All parents were confident of the cognitive skills their child would bring to school.

Social readiness was also a topic of concern. Approximately 40% of the children were a year older than they should have been for kindergarten. The focus of the grade 1 program at Norwood was very academic and children were regularly retained in kindergarten if deemed unready for grade 1.

Rochester. Rochester served a diverse community from wealthy homes to subsidized housing units around the community. A mix of Anglo and Hispanic parents were served. Four out of five parents viewed readiness as age. Within the upper-middle class children, all had been to preschool and benefited from much preparation for school. However, many parents held their children back thinking them not ready for kindergarten. In contrast, many of the Hispanic children came to school not knowing their address, phone number, or colours but the parents expected the kindergarten program to serve their children well. The main goal they held for their child was that their child like school and that the teacher like the child. Academics were secondary.

The vast differences examined with regards to parent's perceptions of school readiness in the three communities outline the need to examine the context, school, and individuals which define readiness in the area. Readiness is thus tied to the beliefs about children, the nature of the curriculum, and the relationships among parents and staff. A successful kindergarten experience may be enhanced through parent support programs, health services, quality child care, and service-provider co-operation.

Gredler, G. R. (1992). *School Readiness: Assessment and Educational Issues.* Brandon, Vermont: Clinical Psychology Publishing Company.

Key Words: definitions/ conceptual models, assessment, solutions, USA

This book provides an excellent overview of the four main models of school readiness. The *Biological Maturation Theory* states that all children will be ready for school at about the same age as readiness is developmental in nature and due to an internal timing device. Children who are judged unready thus need more time to mature.

David Ausubel's *Theory of School Readiness as Growth and Social Experience* states that readiness is a particular state that depends on growth and maturation and the social experiences

of a child. Ausubel describes readiness as the state at which the child can learn easily and without emotional strain, will show adequate motivation because teaching will provide adequate results, and instructional approaches that build on prior learning are implemented. A child may not be ready due to a lack of sufficient learning as well as the child's maturational level.

Lev Vygotsky's *Socio-Cultural Theory* describes readiness as the learner's ability to benefit from collaborative problem solving with a more knowledgeable peer or adult. One should thus look at the child's developmental level (which is the level the child can accomplish easily without assistance) and also the child's potential for further learning or development (with assistance). Culture plays a primary role with respect to readiness. The theory's basic premise is that development of complex mental functions such as conceptual thinking and logical memory are a product of the child's interactions with members of his or her culture. The child's readiness depends to a great extent on the sensitivity, diagnostic skills, and teaching skills of these other members.

Robert Gagné's *Cumulative Skills Model* states that readiness is the mastery of certain prerequisite skills. Learning is cumulative. Developmental readiness is composed of the relevant skills identified as prerequisites for the new learning, regardless of the chronological or mental age, or physical growth, of the child.

Section two of this book examines five issues related to early readiness for school: the rationale for early screening, the instability of children's behaviour, the use of inappropriate measures, the difficulties in defining who is "at risk", and the problems in accurate prediction. Several tests are then reviewed, including the Metropolitan Readiness Test, the Denver Developmental Screening Test, the Meeting Street School Screening Test, and the Gesell School Readiness Test. Overall these tests "overidentify" children at risk of learning or behaviour problems, which results in children being held back or misplaced in intervention programs.

Section three of this book looks at the many issues in the school entrance debate. It then describes some of the school practices currently in effect to compensate for the large number of children identified as not ready for kindergarten. The use of transition rooms is ineffective as, although it allows time for children to mature, they are not receiving additional assistance with the tasks with which they have difficulty. Retention in kindergarten and grade one is similarly

ineffective. It is noted that children who enter school at an earlier age do not have greater rates of school failure or retention. Some of the intervention programs reviewed include a Multi-sensory Vocabulary Approach, an Educational Therapy Approach, Computer-Assisted Instruction, the Writing to Read Program, and Reading Recovery. Many of these programs work based on the increased attention given to students. Programs which emphasise processing strategies, those that blend behavioural facets, and those which analyze learning strategies are most effective.

Kagan, S. L. (1992). Readiness past, present, and future: Shaping the agenda. *Young Children*, 48, 1, 48-53.

Key Words: definitions/ conceptual models, USA

This paper outlines the progression of the concept of learning readiness since the early 1980's. In the past there was a tug between readiness for school and readiness to learn. Readiness to learn is the level of development at which an individual is ready to undertake the learning of specific material. Often it includes attention, motivation, health, emotional maturity, intellectual ability, and developmental state. Readiness for school, in contrast, refers to specific cognitive and linguistic skills such as identifying colours, copying a figure, and counting. It usually limits itself to children entering kindergarten or grade one. From these concepts, maturational readiness has emerged. This refers to a fixed standard which children should attain prior to school entry but also acknowledges that children need to develop according to their own internal time clocks.

Currently, readiness is seen as a vague, general vision of knowing colours, shapes, and numbers but it is not well defined. It is recognized that a child at one school may be deemed ready while at another school this same child would be unready due to the demands of the classroom itself. At this time, two competing theories have emerged. Maturationalists believe that children should not be taught until they are completely ready; while Vygotsky postulated that children were every-ready learners who will grow when introduced to a stimulating environment. The maturationalist theory prevails resulting in many lower-class, minority, and males who are kept out of the classrooms, resulting in classes which are more advanced. The kindergarten classrooms have thus become even more sophisticated. In addition, tests are often used to determined readiness -- and tests on young children often prove inaccurate.

In the future, readiness needs to be redefined and performance standards need to be set. The National Education Goals Panel builds upon Vygotsky's theory and suggests that readiness depends on five domains: physical well-being and motor development; social and emotional development; approaches towards learning; language usage; and cognition and general knowledge. Readiness should be defined by a specific chronological age and instruction modified to match the needs of the children entering school. Parents are the key to promoting readiness in children and thus parent-friendly policies in the workplace must be established. The media should foster learning through educational channels and programming. High-quality early child care should also be promoted.

Kagan, S. L., & Neuman, M. J. (late 1990's but date unknown). ***Defining and implementing school readiness: challenges for families, early care and education, and the schools.*** **26p.**

Key Words: definitions/ conceptual models, assessment, policy implications, USA

This article examines the definitions of readiness and reviews the literature and knowledge about readiness to develop recommendations concerning readiness. The authors make a point that a universal definition of readiness has yet to be decided upon. The researchers in the field agree about the importance of reading to readiness although they agree on little else. The authors state the general definition for readiness to be the average age when an individual reaches the developmental maturity to be able to learn certain material. They also note that the definition of school readiness is much more rigid than the definition for learning readiness. When many researchers began to discuss the topic of readiness they derived five dimensions which, when viewed as a whole, constituted readiness. They included: physical health and motor development, social and emotional development, approaches towards learning, language usage, and general knowledge.

Parents and families are major contributors to the child's readiness level and are, therefore, in need of support to help their children. There is evidence that, although parents are interested in supporting their child, the resources are not always available for this to occur. The authors stress the importance of quality family support programs. As children also spend many hours with other care providers, the field of early childhood education is also very important to support children. Major issues in the field include quality programs and funding for these programs.

Children do not have the ability to be ready to learn without quality programs to support them in their development. Many problems in the infrastructure leads to problems for children. All of the parts must be working together to have high quality accessible child care.

Different kindergarten programs have also made attempts to assist in the readiness process of children. Developmental kindergartens were developed without much success. Redshirting also began as upper class children were held back by their parents for a year to allow them to enter kindergarten more mature and therefore gain a competitive edge. Many of the programs in place to assist children to be ready are not successful in making children ready for school. Thus the emphasis should be placed on the schools' role in the readiness process.

Preparation for school is an important factor in assisting children to be ready for school and to achieve school success. Parent's and teacher's definitions of readiness are different which suggests that, for greater success in readying children for school and learning, the two should talk and work together.

The current assessment measures are inadequate for measuring children's readiness. An effective system of measurement should include: respect for diversity of families, a shift towards collecting social indicator data focusing on children and communities, the use of teacher and parent input along with the child's work samples, and a shift of the readiness burden from the child to schools and the community.

Throughout this article the authors developed four policy recommendations for the government. They include:

1) Give more attention to children and the importance of the early years before school.
2) Conceptualize readiness as children's readiness, family readiness, school readiness, and community readiness.
3) Generate adequate assessment systems for children, schools and communities.
4) Consider children and families holistically." (p. 18-19)

Katz, L. G. (1998). Readiness: Children and Schools. *ERIC Digest.*
http:///www.ed.gov/databases/ERIC_Digests/ed33049.

Key Words: definitions/ conceptual models, indicators of readiness, USA

This article is a summary of school readiness. Currently there are two camps of researchers and practitioners -- those who believe that readiness is maturational and thus we cannot speed up the process for children and those who believe it is environmental and thus early experiences are vital. It has been shown that a child's early experiences, their physical well-being, and their emotional and cognitive relationships with those close to the child are vital. The high rates of delayed school entry, retention in kindergarten, and segregated transition classes show the magnitude of the problem. The increasing use of standardized tests is a cause for alarm as they have been shown to be inappropriate for children under six years of age. To reach the readiness goal one must focus on helping families prepare their children and on helping the schools become ready to instruct children with a wide variety of needs, developmental levels, backgrounds, and experiences. The United States hopes to meet their goal of getting all children ready to read through providing disadvantaged and disabled children with high quality and developmentally appropriate preschool programs, provide training and support to parents as the child's first (and vital) teacher, and enhancing prenatal health systems to reduce the number of low birth weight babies and ensure that children receive the health and nutrition they require for learning.

To help a child prepare socially, one must help them learn to accept authority from others outside of their family, learn to interact satisfactorily with a group of peers, and learn vital social skills such as taking turns, making compromises, and approaching unfamiliar children. To help a child intellectually one must ensure that they understand the language of their peers and the adults at school. For the school to be ready for the children, there must be an appropriate curriculum where meaningful contexts for learning are provided, informal work and play are emphasised, and teachers can appropriately respond to the children (through reduced class sizes or a qualified teacher aide). This is essential as the rule for entry currently in the United States is based on a chronological measurement. Age is the only method which can be used with any accuracy as there is no reliable method of examining school readiness to date.

Lewitt, E. M., & Schuurmann Baker, L. (1995). "School Readiness." ***Critical Issues for Children and Youths*****, 5, 2, 128-139.**

Key Words: definitions/ conceptual models, indicators, USA.

Currently the term readiness is problematic for policy concerns. The term is not well-defined, it is not clearly stated, and it is not measurable. "Starting school ready to learn" combines two basic concepts: 1) *readiness to learn* refers to the level of development at which an individual of any age is ready to begin learning specific material. 2) *school readiness* refers to physical, intellectual, and social development that enables children to fulfil school and curriculum requirements.

Several US surveys completed in the last three years indicate that up to one third of children begin school not ready for kindergarten. In order to aid these children the government has recognized the need for high quality and developmentally appropriate child care; training and support for parents as the child's first teacher; and adequate nutrition, physical activity, and healthy minds and bodies to be ready to learn. Progress made with regards to these goals will be assessed by monitoring the children's health index (percent of children born with two or more health risks), immunization rates, family-child reading and storytelling, and participation in preschool. The two main questions which remain regarding readiness are: "how will it be measured?" and "who is responsible for ensuring that children are ready?"

Meisels, S. J. (1998). ***Assessing Readiness.*** **Paper prepared for the Synthesis Conference on the Transition to Kindergarten, National Centre for Early Development and Learning, February, 1998, Charlottesville, VA.**

Key Words: definitions/ conceptual models, USA

This paper was prepared for the Synthesis Conference on the Transition to Kindergarten by the National Centre for Early Development and Learning in Charlottesville, VA. Throughout this paper the problems resulting from the term "readiness" and the difficulties associated with assessment are outlined. The main theoretical camps and their stance on the issue are explored.

The term "readiness" seems to imply a single dimension and single standard of development and learning. It is seen as the mastery of simpler skills which permit one to reach more complex

skills. However, this concept implies that everyone follows the same trajectory and will learn all of the same skills even though there are vast differences in life experiences and learning opportunities in the United States for young children. In the Fast Response Survey, National Centre for Education Studies, teachers identified the key determinants of readiness as social ones: physically healthy; rested; well-nourished; able to communicate needs, wants, and thoughts verbally; enthusiastic; and curious in approaching new activities. Academic concerns were less important. Overall, the author notes that the definition which is chosen must take into account the setting, context, and conditions under which the child acquires skills and is encouraged to learn.

There are four main theories regarding readiness: the idealist/nativist, the empiricist/environmentalist, the social constructivist, and the interactionalist. The *idealist/nativist* believes that children are ready to learn when they reach that developmental maturity which allows them to sit quietly, focus on work, interact appropriately with peers, and accept adult direction. Development follows predictable stages and cannot be altered by environmental influences. One thus tests through standardized tests such as the Gesell School Readiness Test (although this test has problems with misclassification).

The *empiricist/environmentalist* believes that the concept of school readiness should focus on the external evidence of learning such as what the child can do and how the child behaves. Development is controlled by the external environment. Developmental screening tests are used to assess school readiness (such as the Iowa Tests of Basic Skills, the Comprehensive Test of Basic Skills, the California Achievement Tests, and the Stanford School Achievement Test). These tests are more objectively scored, reliable, valid, and culturally-appropriate than the school readiness tests.

The *social constructivist* theory states that readiness is a set of ideas or meanings constructed by people in communities, families, and schools as they participate in the school experience. The context the child will enter into is vital as one may ask, "ready for what?" Assessment thus should always be completed within the context in which the child was reared and in the context in which the child will be educated in. Proposals were provided as to how assessment may be done.

Lastly, the *interactionalist* theory states that readiness is relative. They are bi-directional concepts dependant upon the child's skills, knowledge and abilities on one hand and the conditions of the environment on the other. Prior experiences, genetic endowment, maturational status, and cultural upbringing are essential contributors to learning readiness. Assessment should occur within context, over time, be integrative, emphasize top-level competence, encourage metacognition, and be guided by developmental standards.

Overall, the author notes that assessments must incorporate data from the child, the teacher, and the community. Performance assessments should be used as they would recognize the heterogeneity in children's lives. The US goal should be restated to read, "By the year 2000, all children will have an opportunity to enhance their skills, knowledge, and abilities by participating in classrooms that are sensitive to community values, recognize individual differences, reinforce and extend children's strengths and assist them in overcoming difficulties." (p.44).

Meisels, S. J., Dorfman, A., & Steele, D. M. (1997). ***Contrasting approaches to assessing young children's school readiness and achievement.***

Key Words: definitions/ conceptual models, assessment, USA

Kagan defines readiness for learning as a child's status prior to encountering new information or skills for acquiring these skills. A child is considered ready to learn when he or she has acquired the prerequisite skills for such a task. Readiness for school, in contrast, is defined as a child's prior status in acquiring certain information or skills. This is often dependant upon specific skills that the dominant culture values such as being able to sit still, recognize primary colours, count to ten, distinguish different shapes, and know one's address. Readiness for school focuses only on the child while readiness to learn focuses on both the child and the environment the child will be going into. This article outlines the benefits and drawbacks of the three main measures for assessing readiness to learn and readiness for school namely readiness tests, achievement tests, and performance assessments.

Readiness tests are designed to assess a child's readiness for a particular program. Examples include the Developmental Tests for Kindergarten Readiness (which includes a measure of assessing social interaction as well as the typical cognitive measures), the Brigance K and I

Screen (the most widely used test); Gesell School Readiness Test (GSRT, one of the only individually-administered tests); and the Metropolitan Readiness Tests (MRT, focusing mainly on pre-reading skills). Although these tests are widely used and can easily be used to make comparisons and judgements they have a number of disadvantages: fewer than one out of ten tests are administered correctly, many have middle class biases, the focus is solely on the child and not on the child's fit with the classroom; many have low reliability, validity, or standardization data or lack this information entirely; the tests do not report sensitivity and specificity; and their content is generally abstract, and verbally-mediated. Sensitivity refers to the number of true positives (or the number of children correctly classified as "not ready" for school) divided by the number of true positives plus false negatives (or the number of children classified as "ready" who really were not). Specificity refers to the number of true negatives (or the number of children classified as "ready" which were) divided by the number of true negatives plus false positives (or the number of children classified as "not ready" who really were ready).

Achievement tests are also used regularly to assess children's level of school readiness. They differ from readiness tests in that they are applicable to all classrooms and all children rather than reporting on a child's readiness for a specific program and that they are a part of a series of tests which generally continue over a child's school career. Examples include the Comprehensive Test of Basic Skills, the Stanford Early School Achievement Test; the Iowa Tests of Basic Skills; and the Metropolitan Achievement Test. These tests generally assess individual and isolated skills, are standardized, norm referenced, group-administered, multiple choice, and machine-score-able. Most tests assess the same skills (namely, word analysis or sound recognition, vocabulary, comprehension or reading, and math). However, fewer than half of the teachers follow the expected test procedures leading to invalid results; the scores often indicate reading readiness rather than learning readiness due to the strong language focus of the test; and the skills are tested outside of their regular context. In addition, these tests are generally used to measure student and teacher progress and thus create tremendous anxiety for all parties involved: the tests are frequently used to decide student placement and teacher rewards and are often published. The tests also have been shown to alter the curriculum and reduce creativity, as teachers prepare students for the tests while abandoning their own curriculum.

Performance Assessments are an evaluation of an individual student's performance based on a teacher's decision about the curriculum. It aims to measure a child's grasp of concepts and

transferable skills by observing over time and in numerous instances a child's grasp of a certain skill. Performance assessments reinstate the teaching of higher-order thinking skills, make assessment relevant to instruction, are interactive, encourage meta-cognition, are situated within the learning context, and are guided by development standards. However, the individual focus of the test poses difficulties in standardization, reliability, and validity. They may be biased. These problems can be overcome by standardizing the developmental milestones to be observed, accurately defining these skills, repeatedly observing the child, and training the observers. One example is the New York Sampling System which uses developmental checklists three times a year, portfolios to document progress, and summary reports to aid the parent's understanding of the child's development. The areas assessed include personal/social development, language and literacy, mathematical thinking, scientific thinking, social and cultural understanding, art and music, and physical development. The child is rated on each developmental skill as "not yet ready", "sometimes ready", or "established". This measure was tested on 100 children from three school districts which were entering kindergarten in 1991. Results were compared to the Kindergarten Achievement Battery of the Woodcock-Johnson Psycho educational Battery-Revised, the Motor Scale of the McCarthy Scales of Children's Abilities, and a 45-item Child Behaviour Rating Scale. Results indicate strong consistency with these tests (alphas .90 to .94). In addition, the predictive validity between the winter and spring Checklist Total Scores was .90. The sensitivity and specificity ratios were .80. Interrater reliability between teachers and researchers was lower (.58 to .67) however this was attributed to the lack of training provided the teacher and the implementation of better training programs in the future.

Overall, with regulations and training in assessment, the performance evaluations appear to be the most comprehensive. They test within context and are quite accurate in their predictions. In addition, they promote student learning and individualization of the curriculum which is beneficial to all students. The tests are interactional, as is readiness, and they document the child's ability to learn over time. Ratings and assessments by outside observers may help in improving the accuracy and validity of these tests. Additional training is required. No other test focuses so strongly on what the child brings to the learning situation and what the learning situation brings to the child.

National Education Goals Panel. *Reconsidering Children's Early Development and Learning: Toward Common Views and Vocabulary*. Goal 1 Technical Planning Group. Sharon Lynn Kagan, Evelyn Moore, and Sue Bredekamp, editors. Washington, DC. US Government Printing Office.

Key Words: definitions/conceptual models, USA

In 1990, the President and 50 state Governors established National Education Goals, the first of which is that "by the year 2000 all children in America will start school ready to learn." The purpose of this document is to clarify each of the dimensions of early development and learning which were recommended by the Technical Planning Group responsible for Goal 1. The group was also looking to achieve a common vocabulary that expresses a current knowledge and common views about the needs of children and the nature of their development.

The three objectives of the first goal were presented:

1) "All children will have access to high quality and developmentally appropriate preschool programs that help prepare children for school;

2) "Every parent in the United States will be a child's first teacher and devote time each day helping his or her preschool child learn, and parents will have access to the training and support parents need;

3) "Children will receive the nutrition, physical activity experiences, and health care needed to arrive at school with healthy minds and bodies, and to maintain the mental alertness necessary to be prepared to learn, and the number of low-birth weight babies will be significantly reduced through enhanced prenatal health systems."

The Goal and its objectives publicly acknowledge that the well-being of young children is a shared responsibility of the family and society, and that "readiness" will only be achieved through collaborative efforts across sectors and institutions. It suggests that all children are entitled to early experiences that will foster their optimal development. It acknowledges that the current definitions of readiness need to be broadened to incorporate physical, social and

emotional well-being. Finally, it affirms the connection between early development and learning, and between children's later success in school and in life.

The five dimensions of early development and learning which are presented are: physical well being and motor development, social and emotional development, approaches towards learning, language development, and cognition and general knowledge. Skills and abilities under each dimension are outlined, as well as contextual conditions, including individual, cultural and contextual variation.

Peterson, R.W. (1994). School readiness considered from a neuro-cognitive perspective. *Early Education and Development*, 5(2), 120-142.

Key Words: definitions/ conceptual models, USA

This article presents a neuro-cognitive perspective for readiness to learn, which was supported through the American national goal that all children should come to school ready to learn. This article examined the question of what constitutes a child's readiness to learn. Through incorporating the neural and cognitive sciences the author attempts to summarize the current understanding of learning readiness in all ages of children from early elementary school to high school. This article is organized into four categories of information presented to further the understanding of learning. The first is neurodevelopmental timetables which are currently used in school systems for approximations of normal readiness. Timetables are based on the concept that the human organism gradually acquires knowledge throughout their life span, and their experiences shape their perception of the world. The author suggests future research should be conducted to determine normal ranges for children's neurological development to determine when new challenges should be introduced with the greatest success rate among students. Also it is stated that readiness should not be categorized as one particular point where children are suddenly considered ready for school, children should be viewed as constantly changing through various stages throughout their development. Recent studies have shown that it is very important that curriculum match children's cognitive development to foster achievement, therefore these timetables are very important to determine times for introducing concepts. Presently time tables are lacking information concerning information on brain development in relation to cognitive functions.

Critical periods of development were also examined in relationship to readiness. It was determined that more research was needed to determine what the critical periods of development are.

Brain plasticity was the third section examined in relationship to readiness to learn. From the neuroscience perspective learning readiness can be related to the brain's constant adaptation to new information and the ability of the brain to modify the nervous system and behave differently according to experiences. Education was related to the brain's constant state of plasticity.

The final section which was examined according to readiness was a study of special populations. The conclusion from this section was that it is important to study the special populations and their abilities to determine the full spectrum of variations found in school age children and their timetables.

These four sections represent a biological framework for examining readiness, and were presented this way to form a whole picture when viewed together. Through the study of the different areas of cognitive science the author draws one conclusion concerning learning. She states that her working hypothesis is: "The readiness of every child and adolescent for school or for learning is strongly influenced by two biological conditions over which the individual has no control. One biological condition...is the maturational level of the individual's brain or neurological development itself, in terms of the range of normal or natural timetables for the development of various cognitive functions...the other biological condition over which the individual has no control is the degree to which his or her mid-brain architecture is attuned to the predominant mode of school instruction. Children who appear ready for school or ready to learn obviously possess capacities for attention and linguistic competence that match the attention requirements and predominantly linguistic modes of teaching that are characteristic of many school subjects" (p.133).

Volpe, R., Peterson-Badali, M., Corter, C., Case, R., & Biemiler, A. (1994*). Possible Roles for Public Television in Getting Ontario's Children Ready to Learn.* Report commissioned by the Distance Learning Division. Submitted to TVO, Toronto, Ontario

Key words: definitions/ conceptual models, Canada.

This document explores the concept of using television as a means of increasing readiness to learn for the at-risk population of children. Different models of learning readiness are examined. The first view of readiness is from the maturational model which views the "physical unfolding" which prepares children for learning. This view is often the dominant view with regards to school readiness.

British Empiricism. British Empiricism focuses on children's learning through the description of perceptual learning, cognitive learning and the transfer of knowledge to other contexts. The behaviorist theories and psychometric theories attempted to describe these three types of learning. Behaviorist theories when put into practice lead to programmed instruction in the schools. Psychometric theories lead to educational tests. The step by step method of teaching children specific skills developed from this perspective. For example, the prerequisites to reading are letter features, phonemes, letter names and letter sound associations. Tests which determined children's prerequisite skills found that children of low SES often had a deficit. This finding sparked the nature-nurture debate. Three things were agreed upon by both sides: there was a deficit in the low SES population, the deficit became larger with each year of school, and that the deficit had to be addressed early. During the 60's a major change occurred where the behaviorist model was replaced with a more cognitive model. The model suggested that learning occurred through top down or bottom up processes. The definition of learning readiness from this perspective depends on "the mastery of elementary patterns, concepts, and skills on which more complex patterns and pattern-processing is dependent (p. 33)."

Continental Rationalism. This theory is based on the work of Kant, who suggests that learning occurs "from the inside out", and well as the outside in. Piaget was another one of the major influential theorists of this perspective. He believed that most human environments met the minimum needs to progress through his developmental stages. Piaget's theories were questioned and revised in the 1970's. Through this perspective learning readiness "depends on the level of

structure that children have constructed in a domain, which in turn depends on the broad range of activities in which they have engaged (p. 38).

Sociohistoric Analysis. This perspective was guided by the work of Hegel, who believes that knowledge is originated from the culture to which the child is exposed. Theorists in this perspective study the social and physical contexts of the culture, the tools they have developed, the role the tools play, and the way the tools are passed on through the generations. Vygotsky is another major theorist in the sociohistoric perspective. Learning readiness from this perspective is believed to be present in all children, since they can all legitimately participate (albeit peripherally) in some meaningful community activity (p. 45). They believe school failure to be attributed to the organization of society and how differences exist in opportunities for different social, racial, and cultural groups.

In conclusion the report states the importance of the different perspectives and notes how each has made specific suggestions to the development of television as a means of increasing the learning readiness of at risk children.

4. Indicators of Readiness

Brown, G. H., & Faupel, E. M. (1987). *The Assessment of Readiness for School: Implications for a Statistical Program.* Report of a Planning Conference, January 13, 1987. Washington, DC: US Government Printing Office.

Key Words: indicators of readiness, assessment, USA

This book is a summary of a conference which was held to discuss the following question: "How can readiness at roughly the kindergarten or first grade level best be assessed in a nationwide statistical study?" Four articles were presented.

"Readiness for school: A teacher's perspective" by Pamela A. J. Selden advocates for labelling children "not ready to learn" rather than "a failure" when they lag behind their peers in the early years. They need to be given the necessary skills in order to be ready to learn rather than just be provided with extra time to mature. The child needs to be able to look beyond their personal family and school; to be able to be a group member (sharing and compromising); to be open and ready to trust others; to be able to take responsibility for self and belongings; to have an adequate attention span; to be able to communicate; to show age-appropriate fine and gross motor skills and memory; to be available for learning; and to have the additional supports required in case of abuse, neglect, or disability in one's past.

"Basic abilities needed as a precondition for school" by Virginia C. Shipman is an article advocating for the importance of the home environment when preparing a child to learn. The child requires adequate rest, good health, self-confidence, self-help skills, oral and auditory understanding of the dominant language, trust in strangers, social skills, ability to delay gratification, ability to attend, evidence of both short term and long term memory, some understanding of cause and effect, curiosity and a desire to learn, and the motivation to do well in an academic setting. The parents should support the child continually throughout the school process as well.

"How children learn" by David Elkind emphasizes the fact that readiness is not something within the child but rather the "degree of match between the child's modes of learning and those required by the curriculum" (p.15). Children should learn through fundamental and manipulative

learning (learning through direct contact with things), permeability (through whole experiences and broad ideas), through the structured imperative (guiding the children through open experiences as they are intrinsically ready to learn), and play (as this serves their self-esteem and self-confidence as well).

"Comments on a national assessment of schoo! readiness" by Lorin W. Anderson outlines what needs to occur with regards to assessing readiness at school entry. She notes that the tasks selected must be appropriate, a sufficient number of skills must be assessed, and more than just academics must be included. The assessment should have the child respond through pointing, acting, doing, or manipulating. When reporting to parents one should focus on what the child can do not on what the child cannot do.

"*Comments on School Readiness*" by David A. Sweet notes that national data regarding school readiness is important so that the public may be informed, so that the schools and state can initiate curriculum and program changes, and so that teacher training programs can adequately prepare teachers. When assessing children, the information should be used for policy decisions and not individual placement decisions.

Gardner, H. (1993). *Multiple Intelligences: The Theory in Practice, A Reader.* New York, NY: Basic Books.

Key Words: indicators of readiness, assessment, USA

This book outlines the fact that currently intelligence is defined as one's ability to master an intelligence test. Intelligence was seen as constant and determined genetically. Western values were put on a pedestal (Westist), the focus was testable abilities (Test), and there was only one approach to problems (Bestist). Gardner, in contrast, defines intelligence as the ability to solve problems, or to fashion products that are valued in one or more cultural or community settings. The seven intelligences (or talents) are linguistic; logical-mathematical (logical, math, and science); spatial; musical; bodily-kinaesthetic; interpersonal; and intrapersonal. The purpose of school should be to develop the intelligences in each student to help people reach personal and vocational goals which are appropriate to their spectrum of intelligences.

According to Gardner, at birth all humans have a core ability in each intelligence. Raw patterning ability in each intelligence is developed in the first year with intelligences developed through a symbol system in preschool and a notational system during school. In adolescence and adulthood, intelligences are expressed through a variety of vocational and avocational pursuits. Thus, in preschool and early grades one should offer the opportunity for children to explore and learn. In school, children need some instruction regarding the notational systems. In adolescence, assistance is needed regarding career choices.

In the individual-centred school it would be recognized that everyone does not have the same interests and abilities and that they don't all learn in the same manner. In addition, no one can learn all there is to learn. It is important to provide a curriculum which explores issues in depth ("less is more"). Apprenticeships should be used during adolescence to supplement school . Assessment is critical in such a school to predict difficulties and to suggest alternative routes to goals using a person's favoured intelligences. However, the use of standardized tests should be abandoned as they cater to individuals with a particular blend of logical and linguistic competence who can succeed with instruments in a neutral or decontextualized environment. A good assessment would monitor the potency of an intelligence directly, be developmentally appropriate in the particular domain of knowledge, and be linked to recommendations for the child provided by an assessment specialist. The focus should be on helping the child bolster weaknesses or combine strengths to reach a goal, not to rank students. An assessment option is via projects and "processfolios" which include descriptions of the development of the project at each stage and reflection on work done.

Hirsch, E.D. Jr., & Holdren, J. Ed. (Date unknown) ***What your kindergartener needs to know: Preparing your child for a lifetime of learning.*** **Toronto, ON: Doubleday.**

Key Words: indicators of readiness, parental views, USA

This book is a combination of an idea book and an information book for parents to aid them in helping their children become ready to learn. The authors believe that it is the environment which helps the child become ready to learn and not a biological timetable which simply unfolds. The domains on which the parent should focus include language and literature; history and geography; visual arts; music; mathematics; and science.

In the language and literature area the parent should ensure that the child learns phonics and decoding skills, handwriting, punctuation and grammar, vocabulary, sentence structure, paragraph form, and other rules and conventions. The meanings and messages of print should be learnt in an enjoyable fashion. A checklist is provided for the parent so that he or she may determine if the program in question will teach the child these necessary skills. (However, it should be noted that the author is biased towards a particular educational approach.) With history and geography the child needs to learn about aspects of his or her immediate environment (family, school, and community) and about history and geography through use of the imagination. For visual arts, art should take the form of doing with many different mediums and the child should understand that art is seeing and thinking as well as doing through discussions . In the area of music a variety of experiences is required. Suggestions for parents are provided. With mathematics, the program should provide the parent with age appropriate and progressive concepts. Both paper and pencil and math manipulatives should be used. Science should be an ongoing exploration of the world with experience and book learning combined. (It should be noted that these recommendations are not backed by research or evidence but a systematic progression by age has been developed until adulthood).

Holloway, S. D., Rambaud, M. F., Fuller, B., & Eggers-Pierola, C. (1995). What is "appropriate practice" at home and in child care?: Low-income mothers' view on preparing their children for school. ***Early Childhood Research Quarterly*****, 10(4), 451-471.**

Key Words: indicators of readiness, parental views, USA

This article attempted to answer four key questions regarding (1) parents' perceptions of their children including their socialization goals and what they value about their children; (2) how low-income women construct their role as mother; (3) what mothers attempt to get from child care providers; and (4) how much of mothers' preferences for child care are affected by others in the community. To answer these questions 14 low income parents were sampled from a mix of Latino, black, and white cultures. Most were single mothers.

Most of the parents sampled began focusing on school readiness as their children turned three. One parent, Harriet, interpreted her daughter's performance on traditional academic tasks as a sign of readiness for school. Knowing numbers, letters, telling time, and colours is important.

The child's need for affection and sense of belonging is vital. Cupertino and respecting others is also important. She taught her child skills through everyday experiences. In contrast, Pamela believed that readiness skills should be taught in school and preschool and spent little time teaching her child. Although there is tremendous individual variation with regards to defining readiness, larger surveys note some general trends.

Two national surveys of more than 8,000 US parents found that in contrast to teachers, parents believed that numeracy and literacy skills were very important aspects of readiness. Parents with less education were more likely to rate specific school-related skills as important. The Profile of Child Care Settings found that 73% of parents agreed that preparing children for school should be a national objective of child care. Lower class parents were more likely to view school as a stepping stone to a career, while middle-class parents viewed school as a place to make learning fun and fun a form of learning. In addition to the academic aspects of preschool, the parents believed that children should be exposed to field trips, art activities, and cooking projects. Play was not viewed as important for education but was for socialization and "being a child."

Keating, D. P. (1994). *Developmental determinants of health and well-being in children and youth.* Working Paper Prepared for the Steering Committee on Children and Youth, Premier's Council on Health, Well-Being, and Social Justice (Ontario).

Key Words: indicators of readiness, solutions, Canada

This paper outlines the determinants of development within each of the stages of development. In prenatal development it is critical to continually assess medical and psychological risks, to promote health education, to encourage expectant mothers to limit or discontinue their use of dangerous substances, and to provide medical and psychosocial support when required. In infancy and early childhood there are many critical needs including the need for a secure attachment, the need for adequate sensory input to promote the development of the neural system, and the acquisition of fundamental cognitive and language competencies. Resilient children have considerable individual attention and a stable social support system. High quality child care is essential for at-risk children while poor child care is detrimental to all children. When children advance to school, other issues emerge related to readiness for school. Thus far, assessments mainly focus on a middle class ideal of what one should know prior to school entry.

However, there is an increasing need for diversity in instruction and recognition of the variety of learning styles. In addition, families play a major role in the child's success. In adolescence, the child requires positive adult role models, opportunities to explore life's choices, realistic opportunities for productive work, and a variety of peer interactions (especially co-operative ones). Thus, although a strong foundation is important in childhood, there are a number of crucial developmental periods within a child's life in which aspects of the social environment also play a critical role.

In order to support children through these transitions, Keating made a number of recommendations. Prenatal care should be universally and easily accessible. High quality day care and alternative parenting placements should be available to all. For high-risk mothers who stay at home, mother-child support is needed. More supportive employment policies for parents are required. Early identification and remediation of problems in the preschool period is needed. Schools must become more effective in dealing with developmental diversity. Adolescents need more opportunities for positive peer relations and socially meaningful tasks.

Love, John M., Aber, J. Lawerence, & Brooks-Gunn, Jeanne. (1994). *Strategies for Assessing Community Progress Toward Achieving the First National Goal.* Reference no. 8113-110. Princeton, New Jersey. Mathematica Policy Research, Inc.

Key words: indicators of readiness, assessment, definitions/conceptual models, USA

This paper focuses on the potential community response to the first National Education Goal that " by the year 2000, all children in America will start school ready to learn". The paper presents a conceptual design for a comprehensive assessment system that schools, communities and states could use to support and promote their children's school readiness. The assessment process could be implemented in the context of kindergarten registration procedures to provide information to inform public policy at the community level about the collective status of children entering kindergarten.

Readiness is discussed as a relative concept. Its definition must include reference to how children's behaviour and development are supported and what the children should be ready for. This includes measures of community and family activities and should include the dimensions of school that affect children's adjustment and success in the early years. These school dimensions

should be part of future assessment strategies in order to provide a complete picture of a community's success in supporting children's readiness to learn and school success.

The assessment system is based on the three objectives of the National Education Goals Panel: 1) "All children will have access to high quality and developmentally appropriate preschool programs that help prepare children for school; 2) "Every parent in the United States will be a child's first teacher and devote time each day helping his or her preschool child learn, and parents will have access to the training and support parents need; 3) "Children will receive the nutrition, physical activity experiences, and health care needed to arrive at school with healthy minds and bodies, and to maintain the mental alertness necessary to be prepared to learn, and the number of low-birth weight babies will be significantly reduced through enhanced prenatal health systems."

It also considers the five dimensions of early development and learning: physical well being and motor development, social and emotional development, approaches towards learning, language development, and cognition and general knowledge.

Several requirements for a community assessment strategy are discussed: (1) assess all key dimensions relevant to the readiness goal, (2) focus on the collective status of children entering kindergarten (this avoids labelling), (3) rely primarily on existing instruments, (4) incorporate multiple modes of assessment, including direct assessment, parent and teacher reports, and direct observation of behaviour, (5) incorporate multiple perspectives, (6) be adaptable to local circumstances, (7) be appropriate for diverse cultural and racial/ethnic groups, (8) balance positive and negative indicators of the readiness dimensions, and (9) be ready for implementation in the near future.

The paper presents and discusses readiness indicators for each of the three objectives and each of the five dimensions, identifying how they could be measured. The four procedures which would be used to provide the measures are a self-administered parent questionnaire, teacher assessments using the Early Screening Inventory developed by Meisels and colleagues, teacher ratings using Graham and Elliott's Social Skills Rating System, Zill's Behaviour Problems Index and health information from the school nurse or child's health care provider.

The paper concludes with potential uses of the data - ranging from community readiness profiles to comparisons to national data - limitations of the strategy, implementation issues and next steps.

National Governor's Association. (date unknown). ***Every Child Ready for School: Report of the Action Team on School Readiness.***

Key Words: indicators of readiness, assessment, USA

This paper was designed to guide reform efforts and stimulate the interest and involvement of policy makers, educators, parents, and social service providers in getting all children ready to learn for kindergarten. The three factors by which readiness will be measured and which it is dependant upon are: 1) disadvantaged and disabled children having access to high-quality and developmentally appropriate preschool programs; 2) every parent being the child's first teacher, devoting time to helping their children learn; and 3) all children receiving the nutrition and health care necessary to be prepared physically for learning. Benchmarks which can measure this progress include maternal supports such as prenatal care; a normal birth weight (above 5.5 pounds); quality health care; safe housing and communities; positive, stable relationships with care givers and primary caretakers; quality, developmentally-appropriate early childhood experiences; and ongoing services and environmental supports. In addition, teachers should acknowledge that all children are individuals and learn differently; schools must be more responsive to the wide range and differences in children; programs and services should be evaluated for outcome measures. Programs which may be important in the lives of young children include special supplemental food programs for women, infants, and children; prenatal care; Medicaid; childhood immunization; preschool education; lead screening and reduction; and smoking cessation programs for pregnant women.

Phillips, D. & Love, J. (1994). Indicators for School Readiness, Schooling and Child Care in Early to Middle Childhood. ***Indicators of Children's Well-Being.*** **Robert M. Hauser, Brett V. Brown and William R. Prosser, editors. New York: Russell Sage Foundation.**

Key Words: indicators of readiness, USA

The authors have drawn on developmental and evaluation literature to identify dimensions of family and child well-being relevant to child care and early schooling that are most predictive of positive child outcomes. They indicate that the conceptualization of the term "school readiness" is characterized by controversy. The concept is generally approached as a school entry measure – as Kagan (1994) describes it, a fixed standard of development enabling children to fulfill school requirements and absorb the curriculum content. Learning readiness, on the other hand, acknowledges the more fluid and cumulative nature of development and adopts a more idiosyncratic , rather than normative, approach. The second tension discussed is the emphasis on the children's readiness for school, with less focus on the schools' readiness for their students. The paper focuses on indicators relating to children's outcomes but the authors recommend that indicators of schools' readiness also need attention.

The paper discusses several potential indicators that could be developed using existing data. These focus on the last three of the Goal 1 dimensions of early development and learning: approaches towards learning, language usage and cognition and general knowledge. The authors recommend three priority indicators for school readiness: exposure to reading at home and in the child care setting, earliest school performance in literacy and number knowledge, and access to some instruction in the native language for children whose primary language is not English. Development of indicators of attitudes toward learning should be a high priority for the future, with special attention to the opportunities provided by the Early Childhood Longitudinal Study to consider this. Also in the future, the list of readiness indicators should include access to educational technology at home and in the preschool and kindergarten settings. The three priority indicators recommended for early schooling are: achievement, progress in school and parental involvement. Priority indicators with respect to child care are: p. oportion of eligible children who receive early intervention programs, quality of child care, and ,proportion of family income spent on child care. A suggested collection schedule for indicators would include major developmental and institutional transitions in children's lives, for which chronological age is an imperfect proxy: when children first enter school-like settings, when they first enter formal school and at grades three-four.

Roy, J., Williams, M., Boydston, R. (1987). *Predicting school readiness through children's drawings.* ERIC Document Reproduction Service Number ED 299 034. 12p.

Key Words: indicators of readiness, assessment, USA

This study attempted to determine readiness for grade one material through the study of children's artistic development. The author cites Wendt, (1978) for the criterion-cognitive developmental approach for readiness assessment where he states that certain modalities exist which must have developed for children to learn higher level symbolic tasks. Yet these modalities are not described further to expand on the learning readiness theory. Roy et al. describes three stages of artistic development used to find a correlation between art and learning readiness. The three stages are: the scribbling stage, the preschematic stage, and the schematic stage. The scribbling stage was described as that stage when the child randomly makes marks on the page and most energy is focused on the fine motor skills required to draw instead of the actually drawing. The preschematic stage describes children's drawings where the child is often in the centre of the drawing and the other objects in the picture are around the child. The schematic stage is where children draw a base line with the objects in the picture placed on the line.

The sample used for the study was of 55 children consisting of 33 females and 22 males who were in kindergarten for the first time. Every child was over 5 years old. The sample was taken from a population in north-east Alabama. The socio-economic status of the sample was a range from low SES to the upper middle class. Most of the children were from upper middle class families. Two sample drawings were taken from the children and a readiness test was also administered. The interrater reliability was very high (96%).

The results of the study showed that art could be used to determine where children would score on the readiness test used (the Metropolitan Readiness Test). As the MRT was not studied in the current study as to its usefulness in predicting readiness one cannot assume that because art is correlated with the results of the MRT that they are also correlated with grade one readiness. One major limitation to this study was the imbalance of high and low SES children: it is questionable as to whether it was a representative sample. In conclusion, the authors cite Kellog (1970) and her theory on learning readiness. She has found through studying children's art work that as the

child's brain develops the ability to recognize and remember the shapes that he or she has previously drawn these shapes become fixed in memory and prepare the child's mind for learning to read and write language... (p 9). She states that children's scribblings provide evidence of how the mind is developing.

This study although interesting, was not conducted with enough depth to use as research to support the use of art to predict readiness. This study should be viewed with caution and note should be taken of the uniqueness of the ideas.

Schoen, M. J. & Nagle, R.J. (1994). Prediction of school readiness from kindergarten temperament scores. *Journal of School Psychology*, 32(2), 135-147.

Key Words: indicators of readiness, assessment, USA

This article reviewed the effects of children's temperaments on their readiness for school. Temperament was described as differences in activity level, sociability and emotionality, which remain relatively constant over situations and time. The author stated that many studies have supported a strong relationship among temperaments attributes, intellectual performance, and achievement.

The concept of school readiness is still controversial due to the limited validity of the tests which are used to assess readiness. Teachers' personal opinions of readiness characteristics and the readiness tests categories also differ. Teachers tend to feel that children need social interaction skills, ability to follow directions, conduct and self help skills to be ready for grade one. The current study viewed teachers' opinions highly and attempted to examine the relationship between the characteristics they found to be important with achievement. The study examines children's temperaments as a predictive variable for readiness test scores.

The children in the sample were mostly white from middle SES families in South Carolina. Children had to be in kindergarten for 3 months to be considered for the study. The sample of children for the study was 152, with 61 boys and 91 girls; the mean age was 6.

Three tests were administered to the children. First the Peabody Picture Vocabulary Test-Revised (PPVT-R) was administered to measure receptive vocabulary. Secondly the Temperament Assessment Battery for Children (TABC) was administered by the classroom

teachers. This test assessed the areas of activity, adaptability, approach or withdrawal, emotional intensity, distractibility, and persistence. Lastly the Metropolitan Readiness Test (5th ed.) was administered by the teachers. This test assessed skill development and academic readiness. It is a widely used scale for the purpose of preacademic and early academic skill assessment.

The results found that temperament of the children may be an important predictive variable for first grade readiness. Three of the scales from the TABC were found to be most related to readiness, persistence, activity, and distractibility. This finding can be applied in kindergarten classrooms by focusing more on persistence. These three categories can be used by parents and teachers to help children to learn how to learn.

Future research which was suggested was the use of intelligence tests such as the WISC-III or the Stanford Binet, as well as using several temperament assessments to reduce bias from teachers' assessments of their students. As well, the authors suggest that sex differences should be further examined.

5. Environmental Influences

Boyer, E. L. (1991). *Ready to Learn: A Mandate for the Nation*, Lawrenceville, N.J.: Princeton University Press. ERIC Document Reproduction Service Number ED 344 663. 173p.

Key Words: environmental influences, solutions, USA

The Carnegie Foundation for the Advancement of Teaching has proposed a ten year campaign to help the country reach the national goal of having every child ready to learn by the year 2000. There are seven main steps to this agenda.

1) *A Healthy Start.* Every child must have a healthy birth, be well nourished, and be well protected in the early years of life as good health and good schooling are intrinsically interlocked.

2) *Empowered Parents.* All children should live in a secure environment. Empowered parents must encourage language development. This is essential as the home is the first classroom and parents the most essential teachers.

3) *Quality Preschool.* Since many young children are cared for outside of the home, high quality preschool programs which provide good care and address all dimensions of school readiness are essential.

4) *A Responsive Workplace.* If each child is to come to school ready to learn, there must also be workplace policies which are family-friendly: supplying child-care services and giving parents time to be with their children.

5) *Television as a Teacher.* Next to parents, the television is becoming the child's most influential teacher. Television programming which promotes school readiness is both educational and enriching.

6) *Neighbourhoods for Learning.* Safe and friendly neighbourhoods contribute to a child's readiness to learn. Safe places for growth and exploration are essential.

7) *Connections Across the Generations.* To be completely ready to learn, connections across the generations are needed to offer children a sense of security in their community.

Specific examples of how these goals may be reached are provided in detail.

Liu, J. M., & Brinlee, P.S. (1983). *Relationships between readiness characteristics and basic skills achievement of rural first grades.* Paper presented at the annual meeting of the American Educational Research Association (Montreal, Quebec, April 11-15 1983). ERIC Document Reproduction Service Number ED 228 016. 22p.

Key Words: environmental influences, urban/rural differences, USA

This article outlines a study from South Carolina which compared readiness status of kindergarten students in both rural and urban centers. Four research questions were studied:

1) What are the similarities and differences between the readiness status of rural and urban children?

2) What is the relationship between readiness status and SES of rural and urban children?

3) What are the similarities and differences between the year end readiness in reading and mathematics of the sample population?

4) What are the relationships between readiness characteristics and achievement of rural first graders?

The authors found little information concerning the uniqueness of the readiness characteristics of rural children. The sample in this study consisted of a random sample of all students in grade one. There were 5,000 children involved, the sample was representative of sex, race, and readiness. Over half of the sample (53%) went to a rural school, whereas 47% of the sample attended an urban school. The definition of a rural school was based on the numbers of children attending the school who lived in communities with less than 2,500 people, over 65% of the school must be in this category for the school to be classified as rural. Urban was defined as those schools where 65% of the students resided in communities with a population greater than 2,500. SES was studied and assessed according to the child's lunch status. Those children who received a reduced price or free lunch were classified as being lower SES than those who did not

receive subsidy. Readiness was determined according to the Cognitive Skills Assessment Battery: to be "ready" a child scored 88 or above.

The results of the study found that 64% of rural children were "ready" where as 68% of urban children were "ready". Three of the subtests showed greater differences in performance: the child's ability to recall auditory information after a brief waiting period, expressive language, and receptive language. The results of the study also showed that SES was more strongly related to readiness than population of a child's community. Of the children identified as "not ready", 78% were classified as low SES - 45% of these were from rural schools and 33% were from urban schools. The last 20% were equally divided between urban and rural school children with higher SES.

In conclusion, the study found that: more urban children were "ready" but the substantive significance was not clear; that SES was more highly related to readiness then urbanicity; and that the difference between rural and urban was small and significant although it may not be meaningful in a practical perspective. This article compared the differences between the two populations but found that SES created a greater division between "ready" and "not ready" children then the school they attended

Parker, L. (1989). *The relationship between nutrition and learning: A school employee's guide to information and action.* Food Research and Action Centre, Washington DC. ERIC Document Reproduction Service Number ED 309 207. 45p.

Key Words: environmental influences, USA

This article reviews the physical, emotional, and intellectual impact of nutrition on the child's ability to learn. It reviews the recent research linking nutrition and academic performance Nutrition is one of the most pervasive factors influencing growth, development, and health. Children require good nutrition in order to benefit from the mental and physical training and education they receive. Proper nutrition needs to begin prenatally. Babies with low birth weights are more likely to suffer from visual, hearing, and mental difficulties. Children also require proper nutrition at daycare, preschool, and home. Unfortunately, however, many children in the United States suffer from under-nutrition (or the result of prolonged lack of food of either quality or quantity). Under-nutrition can increase the risk of illness and it's severity; can make a child

less attentive, less independent, and less curious; can impact concentration; and thus can disrupt the learning process and one's IQ. In addition, obesity can lead to lower self esteem, and lower achievement test scores. Nutrition, thus, may play a key role in one's readiness for school and readiness to learn.

Wang, M. C., Haetrel, G. D., & Walberg, H. J. (1993). What helps students learn? *Educational Leadership*, 74-79.

Key Words: environmental influences, USA

This article demonstrates the fact that direct influences such as classroom management affect school learning more than indirect influences such as policies. Direct influences are those which directly impact the child such as the amount of time a teacher spends on a topic and the quality of the social interaction within the classroom. Indirect influences include policies and organizational features of the school. The factors which have the greatest impact on school learning include classroom-management, metacognitive processes, cognitive processes, home environment/parental support, and student and teacher social interactions. The factors having the least impact include program demographics, school demographics, state-level policies, school policies and organization, and district demographics. (However, one could argue that the indirect influences impact upon the direct influences and thus are still vital).

Student aptitude was the most influential of all of the broad influential categories. Within aptitude, a student's metacognitive processes - or the child's ability to plan, monitor and re-plan learning strategies was the most influential factor. Cognitive processes, social and behavioural processes, and motivational and affective attributes were also important. Psychomotor skills and student demographics were not as important. *Classroom climate and instruction* had the second greatest impact on readiness. Under this category, classroom management, constructive student and teacher interactions, quantity of instruction, classroom climate, and classroom instruction were all important. Academic interactions and classroom assessment had a moderate impact. Staff development and training only had a weak impact on student learning. *Context* was the third most important variable: the home and parental support being the most important variable in this category. The peer group also had a tremendous impact. Community and out of class time had only a minimal effect. *Program design* had only a moderate effect on student learning.

School organization yielded a moderate influence with school culture being the most influential. Teacher/administrator decision making, parental involvement policies, and school demographics and school policies had little influence on learning as policies are not always implemented. Instead, actual practice in these areas had more of an impact. Thus, changes in factors with a direct influence on school learning should be of a higher priority than changes in broad school or education policies.

6. Assessment

Note: Many of the references under "definitions/conceptual models" also discuss assessment.

Buntaine, R. L., & Costenbader, V. K. (1997). The effectiveness of a transitional prekindergarten program on later academic achievement. *Psychology in the Schools*, 34(1), 41-50.

Key Words: assessment, USA

The most popular way to assess school readiness is through using developmental age. Developmental age is the progress of a child through predictable stages. It is not highly correlated with either environmental influences or chronological age. Gesell predicted that developmentally immature children who were given an extra year to mature would experience fewer learning problems and demonstrate advanced academic achievement compared to their matched counterparts.

Recently in the United States, grade retention has been used extensively with children deemed at risk for school failure. The Young Kindergarten program was established for such children. It is designed to give children an extra year to grow and mature. In addition the children are expected to learn the following "readiness skills": developmentally appropriate classroom experience (assuming responsibility for personal belongings and classroom materials, following directions, attending skills); achieving a basic understanding of colours, days of the week and numbers; improving communication and thinking skills; gaining some prereading skills (letter identification and sound/symbol association); and enhancing self-concept. However, in many studies, children who are retained suffer negative social/emotional consequences. The academic benefits of kindergarten retention have not previously been investigated in a controlled study.

This study aimed to discover the academic benefits of grade retention using a predominately Caucasian, upper middle class, suburban school system. Ninety matched pairs of children were selected for the study based on having an immature score on the Gesell School Readiness Test. The children were matched for sex, date of birth, and Gesell developmental age. Nearly all children had attended nursery school. (It should be noted that the norms, validity, and reliability are not proven to be adequate.) The children's progress in second grade was measured through

the Stanford achievement test (of math and reading) and in third grade was measured using the Pupil Evaluation of Progress Measure (of reading and math). It was discovered that no significant academic benefits were gained through retention. There were also no significant differences between groups with regards to placement in remedial reading programs or frequency of classification by the Committee on Special Education. (It should be noted, however, that grade retention may be seen as effective for other social groups as differences have been found to exist between the upper-middle and lower classes).

Campbell, E., Schellinger, T., & Beer, J. (1991). Relationships among the Ready or Not Parental Checklist for School Readiness, the Brigance Kindergarten and First Grade Screen, and SRA scores. *Perceptual and Motor Skills*, 73, 859-862.

Key Words: assessment, parental views, USA

This report compared the results of the Brigance Kindergarten and First Grade Screen (1987), the Ready or Not Checklist, and the SRA Survey of Basic Skills Group test using 73 children (38 boys, 35 girls) from rural, north central Kansas schools in order to determine the effectiveness of such measures.

The Brigance Kindergarten and First Grade Screen (1987) records children's performance on a series of tasks. The areas deemed important for school readiness which are assessed include: personal data response, colour recognition, picture vocabulary, visual discrimination, visual-motor skills, gross motor skills, rote counting, identification of body parts, following verbal directions, numerical comprehension, printing personal data, and syntax-and-fluency.

The Ready or Not Checklist is a parent's appraisal of school readiness of their children. Parents rate their children (yes or no) on performing 43 developmental tasks (for example, Can your child tie a knot?; Can your child walk a straight line?; Is your child unafraid of school?; Does your child pretend to read?). The categories assessed include: age and physical development, gross motor adeptness, memory and attention span, comprehension and reasoning, visual-perceptual skills, general knowledge, and general emotional-social maturity.

The SRA Survey of Basic Skills group tests provide national averages for Composite, Reading, Mathematics, and Educational Ability Quotients. (Additional information regarding these scores was unavailable).

No differences were reported between the children on the Brigance or the Ready or Not Checklist. Parents rated the children very probably ready on the Ready or Not while the children obtained higher-than-average scores on the Brigance. The Brigance correlated more strongly with the SRA scores than the Ready or Not Screen although all scores were correlated significantly. Thus, it appears that parent ratings through a checklist are just as valid as the group or individual screening measures.

de Lemos, M. M., & Mellor, E. J. (1991*). Determining readiness for school: A joint parent and teacher approach.* Paper presented at the 19th National Conference of the Australian Early Childhood Association.

Key Words: assessment, parental views, Australia

In 1990, a ministerial committee was set up in Australia to review age of school entry. To be ready for kindergarten one must be ready to shift from the half-day sessional program to a full-day program with higher teacher to child ratios, larger classes, a different social and physical environment, and different teaching styles. Although the benefits of later school entry have not been shown, parents and teachers often have to determine individual children's readiness for school. This study, conducted by the Australian Council for Educational Research (ACER) and the Monash School of Early Childhood and Primary Education, examines the parents' and teachers' assessments of language and conceptual skills as a basis of assessing readiness.

Approximately 700 children attending predominately English-speaking, middle class preschools were tested using a measure of conceptual development based on copying skills and a measure of language development based on a sentence repetition task. The children were aged 4 years 4 months to 5 years 10 months at the time of testing. In addition, the preschool teachers assessed each child's level of development in the areas considered important for school readiness: self-help skills, social development, emotional development, physical development, fine motor co-ordination, language and communication skills, and conceptual skills. In addition, the children were rated as definitely ready, ready but likely to have some initial problems, likely to benefit

from an additional year at preschool, or definitely not ready to start school. Parents were asked similar questions only they rated their children as ready? "yes, certainly", "yes, probably", "no, probably not", or "no, definitely not". Overall, parents ratings tended to be higher than teachers' ratings and ratings for girls higher than ratings for boys. Parents and teachers agreed most strongly in the areas of social and emotional development. Most children were rated as "high" or "average" in functioning and as "definitely ready" or "probably ready" for school.

Each child was administered a copying skills test in order to determine the correlation between such a test and parent and teacher ratings. The ability to copy a geometric form has long been recognized as indicate of development. The copying skills test was developed based on the work of Piaget and Inhelder. At stage 1 (preconceptual thought; ages 3 to 4) the child is unable to copy geometric forms. By about 4 years a child can copy a circle and a cross and can demonstrate topological relationships correctly. At stage 2 (intuitive thought, ages 4 to 6) the child can copy straight-sided figures correctly such as a square or a triangle. At stage 3 (concrete operational thought, ages 6 plus), the child can copy all forms correctly. Copying a shape involves internal representation and is thus a conceptual task not one of motor co-ordination or perception. 40% of children were found to be in the low average category and 47% in the high average category. Being able to copy distinguishably a circle and a square was significantly correlated with parent and teacher assessments of readiness. However, a significant number of disagreements also occurred.

Overall, it was discovered that there is no common right age at which children are ready for school. No matter what age is set there will still be some children who are not ready for school and who are less developmentally advanced than their peers. In addition, we do not really know what skills or assessments really are important when measuring readiness for school.

Dworkin, P. H. (1993). Ready to learn: a mandate for pediatrics. *Developmental and Behavioral Pediatrics*, 14(3), 192-196.

Key Words: assessment, USA

President Bush has mandated that improving children's readiness for school is one of the most crucial of the six national goals for the year 2000. In a recent survey of Connecticut pediatricians, more than 70% agreed with the statement that, "screening for potential leaning

difficulties in the preschool child should be a routine part of primary pediatric care" (p.193). This article, reviewed the possibility of this occurring and how such screening may occur.

One option is for pediatricians to use traditional school readiness tests such as the Preschool Readiness Experimental Screening Scale (PRESS) or the Pediatric Examination of Educational Readiness (PEER). The PRESS is 4 questions which may be asked during the examination. The PEER is a screening tool including the dimensions of gross and fine motor abilities, speech and language skills, visual-motor skills, behavior, and social skills. However, such instruments have limitations including low validity and reliability and the lack of well-established norms. In addition, the PEER only relates 60% to standardized test results and poorly to academic achievement. Skills which may counteract one's poor scores and aid in academic achievement include higher order conceptualization skills, strategy formation, and creativity. Factors which are omitted by such tests include: confidence, curiosity, self-control, capacity to communicate, and cooperatives.

A second option is developmental surveillance where the pediatrician 1) elects and attends to parent's concerns and impressions regarding their child's development (while accounting for the parent bias), 2) assesses the child informally through having a knowledge of and familiarity with the competencies expected at each age, 3) seeks the opinions of others who are knowledgeable about the child including preschool teachers, and 4) interprets the findings within the context of the child's overall well-being. Although the second option, in theory, appears to be plausible and effective it was discovered that the time pediatricians actually devote to such care is slim. When such care is given, positive results are seen.

Other options which are cited as effective include home visitation programs where support is provided, clinic-based literacy programs (such as waiting room readers), and pediatricians as child activists for better programs. In general, however, teachers' opinions are still the single best predictor of kindergarten success. Parent's descriptions of their child's general development are also good predictors.

Gredler, G. R. (1997). Issues in early childhood screening and assessment. *Psychology in the Schools*, 34(2), 99-114.

Key Words: assessment, USA

This article reviews some of the important issues in measuring learning problems in young children. Screening programs are used under the assumption that they can adequately predict the child's potential problems later in life. Two types of screening measures are used to measure readiness for school. Developmental screening measures assess the child's potential to acquire skills (not the degree to which a certain skill has been acquired). Typically they examine motor co-ordination, memory of visual sequences, verbal expression, language comprehension, and social emotional status. Examples include the Brigance, DIAL-R, and the Gesell. Readiness tests assess learning tasks which are seen as predictive of school success. Areas typically included are cognitive skills, language, motor skills, copying shapes, concept development, and perceptual processes. Examples include the Early Screening Inventory and the Denver II.

One problem with such assessments is the variance in young children's behaviour. In addition, children should not be assessed until 3 months into school to give them time to adjust to the setting and the teacher. Some studies indicate that up to 2 out of 3 preschoolers would be misclassified using existing measures. Results would improve if there were less emphasis on motor skills. An alternative to traditional screening tests is developmental surveillance in which continuous monitoring is completed within the context of the child's overall well-being. The child's current progress would then be included.

Jourdan-Ionescu, C. & Couture, G. (1996). *Learning potential: Independent from the quality of the family environment.* 13p. Eric Document Reproduction Service No. ED 405 993.

Key Words: assessment, USA

This study demonstrated the independence of learning potential (LP) from characteristics of the family environment using the Learning Potential Test. In the past, unemployment, low income, single parenthood, and parental low education level have been correlated to low IQ scores in young children. IQ scores had subsequently been correlated to home environment scores. Learning potential is a measure which is designed to eliminate that bias. LP is defined as "one's

ability to learn from experience, after having received assistance to a task, and transfer this learning to performance" (p.3). It stems from Vygotsky's theory of the "zone of proximal development". This study studied 36 preschoolers aged 46 to 75 months from low and middle SES backgrounds. The HOME-R was used to measure the home environment (provision of toys, games, and reading materials; speech stimulation; expression of affection and warmth; stimulation for academic activities; encouragement to social maturity; and opportunities for variety in stimulation). Learning Potential was measured using the PAV92 form (no details provided) where the child was asked to reproduce a coloured model with physical blocks.

It was demonstrated that LP (as measured by the Learning Potential Test) is indeed independent from scores on the HOME inventory scale. This means that one's ability to learn from experience does not depend on the quality of one's home environment. One's scores on the Learning Potential Test thus are not biased by home background. This is important as it provides us with a means of measuring the actual learning capacities of children from disadvantaged families. Learning Potential may be an important measure in school readiness or readiness to learn. Children from families showing a lower quality of the home environment are more likely to benefit from additional assistance in the classroom. This may be due to a greater difference between the children's current abilities and that child's potential.

Mindes, Gayle, Ireton, Harold, & Mardell-Czudnowski, Carol. (1996) ***Assessing Young Children.*** **Delmar Publishers.**

Key words: assessment, USA

This book focuses on a comprehensive assessment system for children from birth to age eight. It is based on best practice which indicates that decisions should be based on assessment information from multiple sources, using multiple measures. Issues in the assessment of young children include the push for accountability and its impact on teachers and practice, high stakes decision-making and the errors made by using screening and school readiness tests to deny kindergarten entrance or retain a child in kindergarten, and the need for authentic, effective, efficient assessments which take a broad approach and consider nutrition, health, family and community stability, cultural competence, self-esteem and quality learning experiences. These authentic assessments would be implemented keeping in mind that we must have respect for

"childhood as a unique and valuable stage in the life cycle...provide safe, healthy, nurturing, and responsive settings for children ...supporting children's development by cherishing individual differences, by helping them learn to live and work co-operatively and by promoting self esteem." (Feeney and Kipnis, 1989). The book presents methods for carrying out various aspects of child assessments, including parents as partners, observation, testing and alternative strategies. Special issues in infant and toddler assessment, preschool assessment and assessment in primary grades are discussed in separate chapters. Achievement testing and portfolios are covered in the chapter on primary grades. The book includes a useful chapter on using basic concepts of measurement, including guidelines for evaluation of tests, and a descriptive appendix of early childhood tests.

Morrongiello, B.A. (1997). *Tapping School Readiness in the NLSCY: Measurement Issues and Solutions*. Hull, Quebec: Applied Research Branch, Human Resources Development Canada.

Key Words: assessment, Canada

This paper considers the five dimensions of school readiness outlined by Gillian Doherty (1997) as they apply to the National Longitudinal Survey of Children and Youth (NLSCY). These dimensions are physical well-being and motor development, social knowledge and competence, emotional health and a positive approach to new experiences, language skills and general knowledge and cognitive skills. Three approaches to detecting children at risk for school problems are discussed: instruments that measure readiness directly, those that measure cognitive processing abilities that are relevant for school success, and instruments that measure developmental status. Direct measures of school readiness measure a child's preparedness to benefit from preschool and kindergarten programs. Such tests include the Developmental Indicators for Assessment of Learning (DIAL-R) and the Lollipop Test-revised. These tests do not allow one to determine the bases for a child's readiness. Tests of cognitive processing skills, such as the Mullen Scales of Early Learning, have a narrow focus on only one domain of readiness. Measures of developmental status assess a variety of domains and allow for a global score of developmental status as well as domain specific scores. They allow one to monitor change following intervention and to determine issues relevant for policy and program

development. The Child Development Inventory (Minnesota) and Vineland Adaptive Behaviour Scale are examples.

The paper reviews several potential instruments for the NLSCY by considering each readiness domain. Given the constraints of a national survey, including home administration and time available, and the goal of covering each of the five domains, Morrongiello recommends the Beery Test of Visual-Motor Integration for four and five year olds, the Expressive One Word Vocabulary Test for two to five year olds, and the Vineland Adaptive Behaviour Scale for all ages. She also recommends keeping the two existing measures, the Peabody Picture Vocabulary Test –Revised and the Motor and Social Development Scale.

National Education Goals Panel. (1998*). Principles and Recommendations for Early Childhood Assessments.* Goal 1 Early Childhood Assessments Resource Group. L. Shepard, S.L. Kagan and E. Wurtz, editors. Washington, DC: US Government Printing Office.

Key Words: assessment, USA

The principles and recommendations in this document are a response by the Early Childhood Assessments Resource Group to Congress' request of the National Education Goals Panel to create clear guidelines with respect to early childhood assessments. In this paper, the Resource Group indicates how best to develop assessments of young children as well as help state and local officials meet their information needs. Six general principles for policies and practices of assessments of young children are briefly discussed. (1) Assessments should bring about benefits for children. (2) Assessments should be tailored to a specific purpose and should be reliable, valid and fair for that purpose. (3) Assessment policies should be designed recognizing that reliability and validity of assessments increase with children's age. (4) Assessments should be age-appropriate in both content and method of data collection. (5) Assessments should be linguistically appropriate, recognizing that, to some extent, all assessments are measures of language. (6) Parents should be a valued source of information as well as an audience for assessment results.

Four purposes for assessments are defined and discussed with respect to audience, technical requirements, age continuum and recommendations for policy makers. The four purposes are: (1) assessing to promote children's learning and development, (2) identifying children with special

needs, (3) monitoring trends and evaluating programs and services, and (4) assessing academic achievement to hold individual students, teachers and schools accountable.

Shepard, L.A. (1997). Children not ready to learn? The invalidity of school readiness testing. *Psychology in the Schools*, 34(2), 85-97.

Key Words: assessment, USA

This article reviewed the technical and policy aspects of readiness testing in the United States. The author found readiness testing to be widely used throughout the States, yet there are no controls (except in Georgia) in place to have standards for testing. This article examined the effects of testing on the curriculum of kindergarten and grade one. It was found that because of testing, preschool and Sesame Street watching, the curriculum of kindergarten through the 80's changed to cater to a developmentally more mature student. Testing created a greater difference between the rich and the poor. Children from richer families began to stay home until they were 6 to allow them a competitive edge, whereas the children from lower socioeconomic families were suffering from a lack of preschool education. They were thus failing the readiness testing. This article also examined the varying results of the suitability of having children repeat kindergarten. Both negative and positive results were discussed. Readiness testing tends to lead to tracking according to ability groups which has negative impacts on children. The response to readiness testing from the professional organizations was that all children are ready to learn and there is no threshold point for learning. The author's position on testing of young children is that it is inaccurate compared to testing of older children. Some of the tests being used for kindergarten readiness are based on theories which date back to the 30's and are no longer supported by research. Other tests, such as the Gesell School Readiness Test is widely used but lacks adequate reliability or validity data. The conclusion of this article sums up the responses to the problems with testing, where some areas have eliminated it altogether. Many states are currently not legally allowed to deny admission to kindergarten because of testing. The results of the problems with testing have lead to some positive aspects such as new assessment procedures where work samples are taken from children along with teachers' observations. (For more information regarding work sampling see Meisels, 1992).

Tramontana, Michael G., Hooper, Stephen R., & Selzer S. Claire (1988). Research on the Preschool Prediction of Later Academic Achievement: A Review. *Developmental Review*, 8, 89-146

Key Words: assessment, USA

This paper reviews 74 studies of longitudinal research on the preschool prediction of later academic achievement, published from 1973 to 1986. Methodology and substantive findings were considered in the review. As outlined in the abstract, "Effective predictors were found to span cognitive, verbal, and perceptual/ perceptual -motor areas of functioning in the preschool child, as well as behavioural and demographic factors.... Overall, the research has succeeded in identifying a general set of preschool measures that should allow a gross discrimination of children who are likely to fall at the extremes of academic ability in early elementary grades. More attention must be given to selected methodological issues if better discrimination is to be achieved. These are outlined, and the incorporation of a theoretical framework based on neurodevelopmental concepts is discussed."

7. Solutions

Keating, D. P. (1998). Enhancing learning readiness: The family and the preschool child. *Transition*, March 1998, 13-14.

Key Words: solutions, environmental influences, Canada

A child's readiness to learn at the beginning of school will have a great impact on that child's later school success. Thus, we should all help children develop the necessary skills involved in readiness to learn. One of those skills is self-regulatory: the ability to regulate one's behavior, emotion, and attention. These skills will help children to benefit from and participate in effectively the activities of school. This can be developed through good, solid attachments early in life. Children need to be introduced to increasingly difficult tasks in order for them to learn to attend effectively. In addition, children's general cognitive skills need to be fostered -- and early life experiences are central to this brain development. Children should be introduced to a diversity of stimulation through which the world can be examined. The experiences also need to be structured. In addition, children need the basics of literacy and numeracy. Establishing a foundation for these skills is more important than rote memorization and drill. Reading together and making reading fun is central to these skills. A strong base of phonological awareness is also essential. Rhyming activities can help children foster these skills. Counting games can enhance math skills and make math fun. Addition, subtraction, and discussion of meaning in everyday experiences are essential. Learning these skills does begin at home and in the community.

Lamberty, G., & Crnic, K. (1994). School readiness conference: Recommendations. *Early Education and Development*, 5, 2, 165-176.

Key Words: solutions, USA

This paper summarizes the recommendations made regarding school readiness at the School Readiness: Scientific Perspectives conference held on January 24-26, 1992 at Columbia, Maryland under the Maternal and Child Health Bureau.

Seven major recommendations were made:

1) *The concept of school readiness must be redefined.* Instead of school readiness the term "readiness to learn" should be used as it implies a continual process of learning and adaptation which applies to children of all ages. It also acknowledges the years of learning and preparedness that occurs prior to school entry.

2) *The biological foundations of learning should be acknowledged.* Both biological and environmental factors are important. Critical periods of development should be identified.

3) *The context and contextual transitions in learning must be recognized.* The family is considered the primary influence on a child's readiness to learn. Early day care environments, preschools, elementary schools, playgrounds, neighbourhoods, and society and cultural values also impact children significantly.

4) *The role of schools and teachers should be expanded.* A family-school-community connection should be made with regard to readiness. Current practices should be open to question. A variety of health social, and educational practices should be integrated.

5) *The growing diversity of our culture needs to be more fully integrated into learning.* This should occur both within and between cultures.

6) *New assessment instruments should be developed.* The new assumptions regarding readiness to learn should be integrated into the new assessment tools. Competence as an adaptive process in development should be acknowledged. The benefits, as well as the drawbacks, of labelling should be further examined.

7) *Funding agencies need to receive advice regarding areas of strategic importance.* Research funding should be organized around network arrangements where ideas, methods, and findings are pooled to provide valid conclusions.

Liddell, C. & McConville, C. (1994). Starting at the bottom: Towards the development of an indigenous school-readiness program for South African children being reared at home. ***Early Child Development and Care*****, 97, 1-15.**

Key Words: solutions, South Africa

This article reviews the effectiveness of an intervention program aimed at low SES children in South Africa. This program was designed with the cultural values of the community as an important factor which needed to be preserved and acknowledged. Some of the various programs which have been attempted in developing countries include parent support programs and toy demonstration programs -- both of which tended to be only moderately effective. One problem existing in developed countries is that very few intervention programs exist for young children in need. In the developed countries around 30% of the preschool age children tend to be serviced by intervention programs. This support is not available in the developing countries.

This study attempted to create a cost effective and culturally valued intervention program for young children. A kit was provided to the families with materials to promote learning and school readiness. The researchers allowed the adults to use the materials in their own manner. The homes of the families in the study were completely lacking materials for young children and thus materials such as building blocks, puzzles, and paper were included to provide the basic materials for children. Parents recognized the value of materials for their children but were unable to afford them.

The sample consisted of 60 children who were in matched pairs according to gender, age at testing, nature of primary care giver, education level of family, maternal education, and family size. Each child was randomly assigned to one of the groups the experimental or the control group. None of the children had any preschool experience.

Two home visits were conducted to provide some demonstrations as to how the toys may be used, the kit was left with the family for six months. After the six months, the children were tested with the McCarthy Scales of Children's Abilities. The results showed that the children fell well below the norms for American children. The kit did not create great differences between the two groups as was expected. Four of the eight subtests showed small improvements at the significant level as well as over all scores. The items in the kit were examined and it was

determined that the materials to enhance nonverbal skills were less effective then those aimed at verbal skills. The researchers did not want to control how the materials were used, but they also did not collect data regarding how the parents used the materials for further study and comparisons. This program showed moderate success rates at a reasonable cost.

United Way of America. (1993*). Standards for Success: Building community supports for America's children.* Alexandria, Virginia: United Way of America.

Key Words: solutions, environmental influences, indicators of readiness, USA

This article summarizes what is known about creating environments that foster the healthy development of children and families. It describes what the role of families and communities must be to ensure that our children are ready to take the place of the present generation. The Mobilization of America's Children is an endeavor to expand the nation's capacity to aid children and to put into place practices that we know to be effective. It has a preventative focus. These coalitions focus on drawing attention to children's needs, improving access to quality services for children and families, and providing leadership on public-policy issues involving children.

An effective local mobilization coalition must involve leaders from key community sectors; ensure adequate staff; build a consensus on a shared vision; assess community needs and capacities; work to increase access to high-quality, coordinated, and integrated services for children; work to improve public policy; and evaluate changes in the well being of children. Effective programs for children and families have a clear mission focus; take a long-term view of their work; are rooted in the community; support parents; foster relationships of respect among participants and staff; attract and retain high quality staff and volunteers; have adequate, stable, and flexible funding; and measure progress regularly.

When monitoring well-being and readiness in children one should consider the child's physical health, emotional health, social skills, and cognitive/educational development. Measures of good physical health include normal birth weight, no preventable handicaps, free from preventable diseases and accidents, free from hearing or vision defects, and performing at appropriate developmental levels. Good emotional health includes a basic sense of trust, a sense that the world is predictable and rewarding, curiosity, an eagerness to try new things, ability to control one's behavior, positive self-image, and a positive regard for one's language, race, and culture.

Important social skills include cooperative play, ability to follow directions, eagerness to please adults, attachments to adults outside of the family, and communicating clearly with adults and children. Cognitive/educational development is measured by the ability to identify facts about one's environment and self, ability to make choices, ability to share information which was experienced, can stick with a task, shows an interest in learning, and make oneself understood. A list of community supports that can foster these skills is provided.

8. Early Childhood Programming

Bredekamp, S. (1996). 25 years of educating young children: The High/Scope approach to preschool education. *Young Children*. 51(4), 57-61.

Key Words: early childhood programming, USA

This article reviews the book, *Educating Young Children: Active Learning Practices*. The book is an updated copy of the 1968 version with current theories in place. It discusses how and what to teach children. Some strengths of the book are its conceptual coherence and the organizational structure. There are specific examples of things adults can do with children. One highlight of this book is that the message is conveyed well. The authors strongly support their system and methods.

The High/Scope approach is based on theory and research. One study cited in the book reviews studies that developmentally appropriate curriculum in prekindergarten lead to increased academic achievement in first grade. In another study relationships were found between positive child outcomes and program quality, in-service training of teachers, and teachers' experience.

This High Scope foundation contributes to the field of early childhood education through contributions to research, curriculum development, professional development and advocacy. One experimental school project, the Perry Preschool Project found significant benefits to preschool participation for 27 years after the effect.

This book was highly recommended by the author.

Brewerton, M. (1997). Te Whariki: *National early childhood curriculum guidelines and its relationship with the New Zealand curriculum for schools.* 18p

Key Words: early childhood programming, New Zealand

This article outlines the curriculum guidelines for Te Whariki, an early childhood program in New Zealand. These guidelines were developed under the belief that early childhood education is the basis for effective lifelong learning and helps one to become ready to learn. These guidelines were meant to be consistent with the school curriculum without jeopardizing the early childhood

program. The areas considered essential for learning readiness include language and languages, mathematics, science, social sciences, technology, health, physical well-being, and the arts. Essential skills include: communication, numeracy, problem-solving, information, self-management and competitive, social and co-operative, physical, and work and study skills. An amazing 91% to 94% of respondents agreed fully with the principles, aims, and goals of Te Whariki. 93% of centres believed that they could implement these guidelines quickly and with only minor changes to their charter.

The basis of Te Whariki ("a woven mat") is empowering children (providing the knowledge, skills, and attributes to enable children to direct their own lives); holistic development (integrating physical, intellectual, social, cultural, and emotional dimensions); relationship with family and community; and responsive, reciprocal relationship with people, places, and things. The curriculum has the following aims and goals:

1) well-being - to protect and nurture the child's well-being through promoting health, nurturing emotional well-being, and keeping the child safe from harm.

2) belonging - giving the child a sense of belonging through connecting links of the family with the wider community, letting the child know that he or she has a place, making the child feel comfortable with the routines, and ensuring that the child understands the limits of acceptable behaviour.

3) contribution - ensuring that all children have equal opportunities for learning, that they are affirmed as individuals, and that opportunities to learn with and alongside others are encouraged.

4) communication - the languages and symbols of all cultures present are promoted and protected. Children learn to communicate verbally and non-verbally and discover different ways to be creative and expressive.

5) exploration - the children learn through active exploration of the environment. Play is valued. Children gain confidence and control of their bodies. They develop strategies for learning and working theories for making sense of things.

The assessment of the child's learning readiness will be on-going as children's behaviour varies day to day and hour to hour. The child should be assessed in a variety of settings and different times of day. (No other specifications were provided.)

Entwisle, D. R. (date unknown). *Recommendations for the NCES Longitudinal Study of Early Childhood/Early Education.* Baltimore, MD: The John Hopkins University.

Key Words: early childhood programming, USA

This article outlines the positive effects of preschool education on the future achievement of students. The most solidly established preschool effects are a reduction in special education and grade retention up to the end of high school. In addition there are increases in the parents' vocational aspirations for their children, positive effects of IQ (an average of 8 IQ points in the next three years), being more orientated towards achievement, better outcomes after high-school, greater market activity, and less criminal behaviour due to attaining a preschool education. Greater effects are found for high quality programs (those with trained teachers, high ratios of teachers to children, and greater involvement of parents). This effect may be due to the high degree of parental involvement stimulated by these programs. Comparisons of preschool programs illustrate that there are no clear differences found between programs in home, centre, or mixed settings. Unfortunately, it has been discovered that only 27% of children from low income families were enrolled in preschool compared with 42% of those from more affluent families. For children attending day care, the differences between middle and lower class children are caused, not by schooling, but by the differences in the home resources available to the better-off children.

Preschool education has positive effects on later schooling as well. These effects are demonstrated through measures of socio-emotional functioning, self-esteem, motivation, social behaviour, and school readiness. The long-term effects of preschool education may be due to the indirect affect on ease of the first grade teacher to teach the child, the reputation which follows the child, teacher expectations, parent involvement in schooling, and the highly cumulative effect of the schooling process. The parental impact on later school success has an even greater effect on future achievement than the child's actual skills. As reading scores at the grade three level are the best predictor of adult success and as preschool education has a great effect on grade three

reading levels, preschool education is vital. The child's temperament has a major effect on the child's progress as well.

Karweit, N. (1987*). Effective Kindergarten Programs and Practices for Students at Risk.* Washington, DC: Office of Educational Research and Improvement. (ERIC Document Reproduction Service No. ED 291 835). 49p.

Key Words: early childhood programming, solutions, assessment of programs, USA

This article examines the research regarding early childhood programs and practices for students at risk (mainly at the kindergarten level). It is based upon programs currently in use in the United States. One main concern regarding the research is that comparisons are made across kindergarten programs although the variety of kindergarten programs and practices varies extensively across the United States and with each teacher. The length of time spent in kindergarten, amount of time relegated to academics, group or individual instruction, public or private programs, and the classroom ethnic make-up and student readiness vary extensively.

Children are generally retained in kindergarten due to immaturity, being of a small size for kindergarten, inability to sit still, and retarded fine or gross motor abilities, or delayed language skills. This is evaluated with standardized screening measures or teacher judgements. Actions which may result include repetition of the kindergarten program, additional time spent within the kindergarten year, or alternative programs. Repetition is by far the most common approach although these "transition rooms" have not been shown to be effective. Placing students in full-day kindergarten programs also have only limited effects. These full day programs have also been shown to have similar amounts of academic instruction as half day programs through out the day. Alternative programs which are based on learning through different modalities and learning styles are very effective measures. (However, it should be noted that the number of studies demonstrating this effect are not conclusive due to the wide varying nature of the classrooms in the United States. There does, however, appear to be a consensus of effect across programs).

Some of the programs shown to be effective include:

1) *Alphaphonics/Asta's Math Magic Program* (a systematic, sequential lesson program in a game-like format which is both motivating and fun as it works through the letters of the alphabet and 22 math lessons).

2) *MECCA or Make Every Child Capable of Achieving* (a diagnostic/prescriptive program which provides daily observation, assessment and planning for specialized teaching depending on the children's needs. Task analysis is used to break the skills down into their component parts).

3) *TALK* (a program designed to improve expressive and receptive language skills through structured activities which foster language growth. Two hours a week are spent on this program and the effects are great).

4) *MARC or the Multisensory Approach to Reading Readiness Curriculum* (a reading program which emphasise knowledge through the senses through systematic delivery and management).

5) *First Level Mathematics* (a continuous progress, developmentally oriented math program provides for independent growth as children are tested to determine their placement in the lessons. The fine motor skills generally required for math are eliminated from this program).

6) *Early Prevention of School Failure* (a developmental screening, prognosis, and training program based on identifying learning styles in the areas of fine motor, gross motor, auditory, visual, and language areas. Students are pulled from the regular curriculum to receive training where skills are broken down into their sub-components).

In summary, the programs which are effective are those in which the curriculum is structured (especially for low SES students), a systematic approach to instruction is used, the program is detailed and specific, is multi-sensory, and is not overly rigid but allows for individual variation. It does not seem to matter if the program focuses on whole-group or individual instruction. However, the success of these programs may not be transferable to all classrooms or groups of children. More research is required.

Part II

Issues for the Development of the Measurement Instruments

1. Introduction

The Applied Research Branch (ARB) of Human Resources Development Canada (HRDC) is developing a program of research to study readiness to learn using the National Longitudinal Survey of Children and Youth (NLSCY). This Issues portion of the paper examines the relevant policy development and data collection issues for the measurement instruments, from the perspective of ARB and its needs. Following this, in Part III, is a framework developed to guide the data, research and policy strategy for ARB.

2. Objective

The objective is to develop rich data, empirical evidence and policy relevant information for the development of public policies in support of ensuring that children are ready to learn and become learners for optimum human development.

To achieve the objective, it is essential to develop strategies for:

1) information for the development of policies and

2) data to be collected through the National Longitudinal Survey of Children and Youth (NLSCY).

While the issues for these two strategies are inter-related, they are not the same. For this reason, this paper has two parts: issues related to data collection through the survey and issues related to analysis and information on readiness to learn. Since the requirements for policy relevant information drive the strategies for data collection, the former are presented first.

3. Policy Development Issues

1) *The goal of readiness to learn:* As a goal, this term has captured the popular imagination and has garnered political support. This term occurs in goal statements such as the American "Goal 1", which states "By the year 2000, all children in America will start school ready to learn", which was promulgated in 1990. However, the complexity of measures to support the goal is enormous. By 1994, The US National Education Goals Panel states "The Panel could find no good data or methods to measure children's status when they started school.". Meisels and others have suggested that the goal itself can be re-interpreted to mean that all children will have the opportunity to enhance their skills, knowledge and abilities in preparation for school, so that the focus is on the early years rather than school entry (Meisels, 1998).

   In the Canadian context, the mandate of HRDC stresses human development in general, rather than a strict school focus. Readiness to learn as a goal in this context recognises the important role of learning in an individual's life, starting from birth and continuing beyond school. In policy terms, there are two major sets of activities. The first is to meet the government's promise to monitor the level and change in readiness to learn of children on a regular basis. The second should provide evidence-based information for identifying effective and age appropriate policy interventions. To do so would require the examination of learning in a multi-dimensional child development context in the early years using analyses, selected for their explanatory and predictive capacity for school success as well as later employment and life achievement. This goes beyond rating children as passing or failing in relation to a minimum threshold.

2) *Confusion around terms and concepts:* Though interest in the status of children entering school has a relatively long history, the current policy spotlight on the issue is recent. As work proceeds, confusion has arisen around two terms, readiness for school and readiness to learn. They have in the past been used interchangeably, however, the utility of these two terms for policy purposes are quite different. Kagan (1992) defines readiness to learn as "the level of development at which an individual is ready to undertake learning of specific material" while readiness for school is a child possessing "specific cognitive and linguistic skills such as identifying colours, copying a figure and counting". The former is a wider definition, including health, emotional maturity, attention, motivation, intellectual ability and

developmental status. The latter tends to be more academically focussed, though teachers themselves appear to stress non-academic requirements. Critics have pointed out that the first is too amorphous to be useful for policy purposes while the second is too narrow, stressing "teachability" in a school setting. There is pressure to use a more "holistic" view, investigating learning outcomes in a child development context.

3) *Difficulties with the term "readiness":* The term readiness grew from predictable developmental "milestones" that were correlated with age. School entry is still regulated by age rather than by readiness in most countries. But as Meisels (1998) questions: Is it something we wait for or is it something we impose? However, the lack of congruence between the complexity of learning and the simplicity of a single measure has resulted in negative criticism. The US Goal 1 Technical Planning Group notes that it would "assiduously avoid the use of the term readiness", since it often implies a single dimension and a single standard of development and learning. The greatest difficulties arise around the use of a readiness measure for screening. Screening out and labelling of children can cause greater harm than good. Others have pointed out that children who are screened out, perhaps have a greater need for school, since their home environments may not be optimal for learning.

4) *What is the focus of study - learning or child development?* Readiness to learn is often equated with child development or even child well being. While there may be some truth to this aggregation, it is not useful for policy purposes. It is necessary to examine if in fact, children have successes or difficulties in learning and if they are able to apply their learning in new and unrelated contexts.

However, learning and cognitive development must be examined in a child development context. In a foetus and new born, they are synonymous, since the brain is wired then for a lifetime of learning. Connections between neurons in different areas of the brain mature at different times. As the child grows from infant to toddler to preschool age, various aspects of child development and learning can be distinguished. Pathways of motor, social, emotional and language skills development with milestones have been established. By school age, learning outcomes can be isolated from other domains of development. Physical, social and emotional development are essential but not sufficient conditions for learning. Since they are not a substitute for learning, learning outcomes must be measured. In the school years,

learning becomes more diversified. Piaget describes physical knowledge, logico-mathematical knowledge and social-conventional knowledge. Gardner (1993) identifies seven "human intelligences" or ways people know the world - language, logical mathematical analysis, spatial representation, musical thinking, use of the body to solve problems or to make things, an understanding of other individuals and an understanding of ourselves. What is clear from later life is the diversity of learning and performance outcomes, even when the inputs may be similar. For these reasons, all aspects of learning must be examined in the child development context, which can only roughly be approximated by age. Therefore, learning should be best studied as a continuum rather than as standards related to age.

The child's development can be studied within domains such as physical health and motor development, emotional health, social knowledge and competence and language skills. Development within these domains proceeds in different ways and inter-relates with learning outcomes. The relationships are bi-directional. For example, on the one hand, the abilities to hold a pencil and to turn the pages of a book are important skills that complement learning to read and write. On the other hand, it is also recognised that learning achievements have an impact on self esteem and confidence as well as social networks.

The child's family, social and living environments also affect development and learning. Parenting styles and learning-related activities with the child are major factors, for instance. As the child grows, experiences with pre-school and school also contribute to learning and development. Therefore, it is important to incorporate these into the study of a child's trajectory.

Such a holistic examination of a child's learning in the child development context, should allow the identification of factors impacting on learning outcomes, as pre-requisites, risk factors and protective factors. It should also show the age at which such factors are policy relevant.

Canada would appear to be in good company in this decision to examine learning in the child development context, recognising the interactions. The United Kingdom uses "Desirable outcomes for children's learning" but recognises developmental stages. Recent US Goals Panel literature uses the term "Child development and learning" in preference to readiness to

learn. The US Goals Panel describes development and learning in the following way in its glossary [National Education Goals Panel, 1998].

> *Development:* Growth or maturation that occurs primarily because of the emergence of underlying biological patterns or preconditions. The terms development and learning are distinguished by the presumption that one is caused by genetics and the other by experience. However, it is known that development can be profoundly affected by environmental conditions.
>
> *Learning*: Acquiring of knowledge, skill, ways of thinking, attitudes, and values as a result of experience.

5) *Competing theories:* The literature is rich in competing theories of readiness, child development and learning.

Gredler (1992) describes four theories regarding the achievement of readiness: (1) The Biological Maturation Theory states that all children will be ready for school about the same age as readiness is developmental in nature and due to an internal timing device. (2) David Ausubel's Theory of School Readiness as Growth and Social Experience states that readiness is a particular state that depends on growth and maturation and the social experiences of a child. Difficulties can be caused by the child's maturational level as well as the lack of sufficient learning. (3) Lev Vygotsky's Socio-cultural Theory describes readiness as the learner's ability to benefit from collaborative problem solving with a more knowledgeable peer or adult. The child's development and the child's potential affect learning under adult direction, until the child learns to complete problems without assistance. (4) Robert Gagné's Cumulative Skills Model states that readiness is the mastery of certain prerequisite skills.

Meisels (1998) lists four theories: (1) The Idealist/Nativist states that children are ready to learn when they reach that developmental maturity which allows them to sit quietly, focus on work, interact appropriately with peers and accept adult direction. Development follows predictable stages and cannot be altered through environmental influences. (2) The Empirical/Environmentalist suggests that the focus should be on external evidence of learning such as what the child can do and how the child behaves. Development is controlled by the external environment. (3) The Social/Constructivist theory states that readiness is a set of ideas or meanings constructed by people in communities, families and schools. The child should be assessed in the context in which the child is reared and in which the child will be

educated. (4) The Interactionist theory states that readiness is relative, with bi-directional interaction between the child's skills, knowledge and abilities on the one hand and the environment on the other. Prior experiences, genetic endowment, maturational status and cultural upbringing are essential contributors to learning readiness.

Rather than take a position on these theories, the approach would be to draw on the strengths of several theories. The framework could include: (1) Recognition of the role of the environment by acknowledging the role of the parents as first teachers and the home as the first learning environment. (2) Learning as a cumulative process where simpler concepts and skills are necessary for more complex ones. (3) Developmental status is important for learning and age is a rough approximation. (4) Learning is complex and relative depending on the child's life experiences and culture as well as exposure to learning opportunities.

6) *Learning outcomes*: Learning is not a monolithic concept but dependent on how children learn as much as what they learn. The literature points to three sub-components of learning outcomes: cognitive development, learning potential, and general knowledge. Although inter-related, the routes to achievement may be through similar but not identical processes. *Cognitive development* is dependent on the maturation of brain structure through stimulation from rich sensory and learning experiences. It would include numeracy and mathematics skills, memory, logic, abstract thinking and imagination. *Learning potential*, sometimes called study skills or learning processes, appears to consist of attitudes, meta-cognitive processes and learning styles: (a) attitudes such as openness to learning, task persistence and learning for its own sake. (b) meta-cognitive processes such as seeking sources of information, sorting the relevant from the irrelevant, organising and analysing information, reflection and interpretation and sharing information; learning processes which include use of questions, comparisons and evaluations of options, cause and effect, problem solving and application to new and unrelated contexts. (c) learning styles encompass aural, visual, text based or learning by doing. *General knowledge* entails an understanding of the child's environment and the world as a foundation for historic, geographic, scientific and technological knowledge. Basic information provides structure to examine if information is consistent with stored knowledge, to question and understand new information and to serve as hooks for storage and retrieval of information in memory.

Language skills can be included as learning outcomes but because of their essential role for communication and social development they are seen a fundamental part of child development with strong ties to learning.

For proactive policy interventions, it is necessary to be forward looking in the way outcomes are measured. For example, the United Kingdom process suggests that children should be able to explore information held on information technology systems.

7) *The requirements for evidenced-based policy for human development:* Much of the work in this field is in support of school policies and programming. For example, the US Goals Panel describes the purposes for its assessment: to support learning (in school), for identification of special needs; for program evaluation and monitoring trends and for accountability. These assessments, therefore, concentrate primarily on actions that may be taken once the child is in school, though child development before school is also of interest. In the Canadian case, the focus is on policy measures that can be taken to support child development and learning in the preschool child as well as through school and beyond. The policy research targets the individual in its application, rather than the school or education. The NLSCY offers an unparalleled opportunity to follow learning and performance trajectories. It is important to understand the routes to success, the routes to delayed or supported success, as well as the routes to failure. Readiness to learn at age six is not the only goal but readiness to learn throughout development, particularly since performance and achievements vary widely.

8) *Age appropriate measurements:* The dilemma is that learning and development in the critical early childhood period are the most difficult to measure accurately and reliably. The younger the child the more difficult it is to obtain valid data. In the period from birth to about nine years, children's rates of development are higher than at any other time in life. Foundations for learning are laid for the future. Achievements are rapid, episodic, uneven and highly influenced by parenting, the quality of non-parental care and learning settings. This argues for including data collection from several sources as well as some longitudinal follow-up to understand the child's development and learning and the influencing factors.

9) *Function rather than dysfunction:* Much of the psychological literature presents studies of children at risk and children facing difficulties. This may be a natural consequence of the difficulties of defining desirable outcomes. The focus of policy research, however, should be on all Canadian children, profiling strengths and weaknesses, so that development and learning trajectories can be examined for subgroups. Clusters within patterns can be noted to look at the progress of gifted children, late bloomers and population subsets such as immigrant children learning in a language other than their mother tongue. It is important to be able to understand patterns of development and learning, including positive variations, identification of early warning signals, sorting out insignificant delays from significant ones, diagnosing deficits that are usually easy or difficult to overcome and recognising learning disabilities that require special attention. The trajectory approach can be helpful in noting problems that children grow out of and "grow into" as well as the success of preventive, enriching and remedial strategies.

10) *Cultural and intellectual diversity:* Children vary on every characteristic - genetic, cultural, experiential and learning. Learning outcomes are therefore very individual and effort has been directed to studying genetic and developmental variation rather than contextual ones. Contextual variations have been misinterpreted as deficiencies because developmental equivalencies are not utilised. Scholastic measures have focussed on thresholds and standards to be achieved, without considering diversity and creativity. Such diversity and creativity is increasingly valued as intellectual capital. Thus, learning assessments should not value conformity and standardisation over originality and inventiveness.

Choice of indicators: Research has shown that the predictive power of many of the indicators currently in use is poor. Some results are counterintuitive, for example, the low correlation between IQ and reading and the high predictive power of finger localisation with reading, showing the complexity of learning. Still, the literature shows that a variety of indicators are in use, from a single indicator such as the Peabody Picture Vocabulary Test (PPVT) to a mix of indicators drawn from child development and learning. The preference is for a set of indicators. Effective predictors include cognitive, verbal and psychomotor function in the preschool child as well as the child's overall mental ability. It also depends on positive behavioural adjustment to school and the level of attention and interest in learning as well as the wider socio-cultural

environment (Tramontana et al, 1988). When indicators are chosen, they should explicitly state which indicators are measures of learning outcomes and which are related measures of development.

4. Data Collection Issues

1) *Inclusive or specific?:* While it is possible to limit data collected to a specific model, it is in the public interest to be as inclusive as possible. Since the concept of readiness to learn is a relatively new concept, there are many competing definitions, theories and models. Different disciplines have different views about child development and learning. A rich source of data will allow researchers to test various concepts and models and even develop new models.

2) *Longitudinal data collection*: A developmental approach suggests that data should be collected for every age group rather than only at school entry. Experience has shown that readiness to learn at early ages is related to later success, however, researchers have pointed out that existing tests of readiness are poor predictors of later academic or professional success (See for example, Crnic and Lamberty, 1994). Therefore, by providing a wide range of data and following children over time, it will be possible to both validate the tests as predictors and learn from children's performance over time (until age 9 and, more generally, until adulthood). The US Goals Panel suggests that data will be collected three times for each child, before school, at school entry and in school. The NLSCY will continue to collect data every two years for children 0 to 5 and follow a sub-sample until age 9. Data should be collected from home/community and school since they both appear to be critical learning settings.

   The Canadian government has promised to regularly report on the status of children's readiness to learn. Hence, the data should be collected to monitor the readiness to learn of children of a specific age in the reporting year.

3) *Multiple sources or single source of data*: Young children learn everywhere and through interaction with many people as they grow. There is some research comparing assessments of children's performance by teachers and parents (for example, Williams and Wilkins, 1993), however, through triangulation built in by collecting data from parents and teachers, as well as information through observation of the child, reliability is increased. This strategy has been widely used in other countries, including the Early Childhood Longitudinal Study (ECLS) in the United States.

4) *Choice of instruments*: Researchers and organisations working in this field have pointed out the limitations of existing instruments. These limitations are with regard to age appropriateness, coverage of developmental domains and learning and reliability. The lack of age appropriate measures is evident because, for children under six, there is heavy reliance on parent responses, though attempts are being made to increase the quality of observational and assessment measures. Domains of development such as physical growth and motor development using traditional instruments are better developed than measures for social or cognitive development. The British have included outcomes which "focus on the development of children's imagination and their ability to communicate and express ideas and feelings in creative ways" (Desirable Outcomes for Children's Learning) which are difficult to measure.

   There are great advantages to using measures that have been tested and validated but if they, indeed, do not provide the quality of information necessary, these benefits are annulled. It is possible to selectively use items from existing instruments, as the ECLS has done in the United States. But such a strategy requires a regimen of testing and piloting.

   The use of two instruments to measure the same concept may be valuable, since they can be tested against each other for both consistency and sensitivity. The instruments can be used with a sub-sample rather than the full large sample. However, this strategy may require amounts of time greater than the child's attention span unless a two-stage data collection procedure is used.

5) *Constraints linked to direct observation and assessment:* Direct observation and assessment of children provide more objective measures than evaluations by the teacher or parent. However, there are a number of constraints. First, the amount of time a child can concentrate on assessment instruments has to be considered. Even with built in variety and breaks, 45 minutes may be possible for a 6 year old, but impossible for younger children. Second, the climate of the assessment (stress-free, friendly, fun) and the location (at home, in a formal learning environment) have also been shown to have impacts. Third, some assessments are easier to administer for children of the same age, but not for mixed ages (siblings in a home). Fourth, in Canada, the assessments must be valid in English and French.

Matrix sampling is suggested as an option since the assessments are not being used for screening individual children. Each child only responds to part of the total assessment reducing the time but data is collected on the complete assessment over the whole sample. Valid conclusions can be drawn about how all students would have performed on the entire assessment in a cross sectional analysis. This option is not useful in a longitudinal survey.

6) *Accuracy of measures*: Most measures expect a certain level of development and performance at a specific chronological age. Many researchers have found that young children have a high range of behavioural and cognitive instability. Furthermore, children appear to learn in spurts and learning is episodic. This natural phenomenon poses problems for data collection since the measure or indicator used may not, in fact, be accurate enough for decision making. Solutions that have been proposed vary from two-stage data collection to continuous collection. These options may be impossible for the NLSCY; however, longitudinal data on the child collected every 2 years makes re-evaluation possible. Furthermore, the data on each child cannot be used for screening or individual programming, where inaccuracy (false positives and false negatives) poses the greatest problems. For policy purposes, the survey can provide information on the pattern of learning occurring in children from birth to school age.

   There are, however, challenges in assessing instrument performance linked to the time at which the assessment was conducted. This is especially true if data is collected over a long period. It is important that the actual age in months (or days?) be on the data file.

7) *Construction of scales*: Point in time assessments have been successfully used for screening, such as for entry to school, however, they are not helpful in placing the child's performance in a child development context. The use of "vertical" scales to locate the child's performance in a graded progression over a development period as well as to measure change or growth, has been tested. Such a scale can be used to compare children across ages and to quantify development from data collection to data collection (2-year intervals). The ECLS (US) uses a two stage procedure, where a short set of items which have a broad range of difficulty ("routing test") identifies the applicable second stage test which has more items tailored to the child's ability level. In the NLSCY, a home test is used as a "locator" for children in grades two and above, which then determines the level of test given to the child at school.

Such a vertical scale is useful not only to follow a child's learning trajectory but also to examine it longitudinally.

The United Kingdom suggests a test scale that has a built-in progression. For example, the questions for letter knowledge are: (1) the child recognises his or her own first name by pointing to it. (2) the child recognises at least five letters by saying an appropriate sound when the letter shapes are presented randomly in written form. (3) the child recognises at least fifteen letters by saying an appropriate sound when letter shapes are presented in randomly in written form. (4) when the letter shapes are presented randomly in written form, the child is able to recognise all the letters of the alphabet by saying a name and an appropriate sound for each letter.

8) *Proxies*: Much research has focussed on "markers" such as low birthweight, deficits such as economic deficits, and disorders such as behavioural disorders with respect to development and learning. Since it is difficult to measure development or learning, particularly in small sample research, these are often used as proxies. The NLSCY offers an opportunity to examine the relationships between learning and these negative influences and co-occurring problems by assessing their impact on learning outcomes.

9) *Learning disorders*: There has not been a concerted effort to gather information on learning disorders, their prevalence and the consequences to the child over time. The NLSCY provides an opportunity to identify children experiencing difficulties or delays who are later diagnosed with learning problems and children already diagnosed with learning disorders in order to follow their adaptation and performance.

10) *Comparability*: Since the NLSCY is a national survey, data for children in the various provinces will be comparable (given sample size). However, some consideration should be given to potential comparisons internationally.

11) *Predictive value*: The longitudinal nature of the survey and its national scope provides an opportunity to test the predictive value of both concepts and measurements. The design of the survey should encourage a holistic appraisal of the context in which the child develops and learns, the consequences of life events and choices, and performance over the longer term.

5. References

See Part I of this paper, "An Annotated Bibliography."

Part III

Framework for Data Collection and Research on Child Development and Learning

1. Introduction

The Applied Research Branch (ARB) of Human Resources Development Canada is developing a program of research to study child development and learning using the National Longitudinal Survey of Children and Youth (NLSCY). Based on the bibliography and issues discussion of Parts I and II of this paper, this framework in Part III was developed to guide the data, research and policy strategy for ARB.

2. Context

Since industrialised countries are concerned about their transition to the knowledge-based economy and competition based on intellectual capital, it is no surprise that policy interest is focused on learning and human development. In 1990, the President of the United States and state Governors established their first National Education Goal that by the year 2000, all children in America will start school ready to learn. The National Education Goals Panel stated that "the success of the nation rests squarely on our ability to do well by the very young". Countries such as Australia and the United Kingdom are also grappling with the best way to assess the development of children and their learning to predict and to promote future accomplishments.

In Canada, September 1997, the federal Speech from the Throne included the intention "to measure and report on the readiness to learn of Canadian children so that we can assess our progress in providing our children with the best possible start."

This paper presents a framework for ARB to collect data through the National Longitudinal Survey of Children and Youth (NLSCY) and for research and analyses on child development, readiness to learn and learning.

3. Earlier Steps Upon Which the Framework Draws

3.1 Initial Research

The involvement of Human Resources Development Canada (HRDC) in child development is well established through the management of the NLSCY and the associated research program. Links between the development and learning of children and later employment performance and work success have been recognised by organisations as diverse as The Conference Board of Canada and the Canadian Institute of Child Health. In May 1997, Dr. Gillian Doherty completed a paper entitled "Zero to Six: The Basis for School Readiness," commissioned by HRDC, where she examined five developmental domains of the child from birth to age six to allow the child at 5 or 6 to be ready for school. She explained why and how the first six years of a child's life are important for laying the foundation for successful school adjustment and later adult competence. About the time of the Speech from the Throne, in September 1997, Dr. Barbara Morrongiello developed a paper at the behest of HRDC discussing measurement issues and suggesting solutions for measuring school readiness using the NLSCY.

3.2 Workshop on Indicators

HRDC has risen to the challenge of producing national and provincial indicators for children's readiness to learn in the context of child development. A workshop was held in January 1998, which was attended by a range of people from provincial and territorial government departments of education, the federal/provincial/territorial Working Group on the National Children's Agenda, national and non-governmental organisations and several members of HRDC's Expert Advisory Group on Children and Families in addition to staff from HRDC and Statistics Canada involved with the NLSCY. The objective was to discuss the many aspects of readiness to learn that needed to be considered to produce indicators. It was generally agreed that, to be meaningful, indicators of readiness to learn must include a holistic view of child development, including stages in various domains and key ages for intervention. Such a set of indicators must also take into consideration the interaction between the child and the environment and the process factors affecting the pathway of development. It was suggested that such indicators, at age 5, serve as "post-test" of early child development and a "pre-test" of school success.

3.3 Working Papers

A number of internal documents were prepared to support the development of this framework paper for the purpose of guiding our data, research and policy strategy. Because countries such as the United States and Australia had worked through a number of problematic situations, contact was made with a number of key researchers and research institutions in these countries and key documents were exchanged. An annotated bibliography was written to draw from the most recent experience with the concepts and their measurements. The preceding work led to a short issues paper, listing the questions to be resolved from the ARB perspective. In addition, an inventory of existing potential instruments was made in order to discuss their merits with those who have used them.

4. The Policy Objectives

The overall policy objectives for Applied Research Branch's work on readiness to learn are:

- to monitor the level and change in readiness to learn as an indicator of human development, and
- to provide knowledge through empirical research for effective and age appropriate policy interventions in support of learning and human development by
  - examining learning in a multi-dimensional child development context for the purpose of identifying the range of trajectories followed by Canadian children
  - identifying the risk and protective factors and their inter-relationships with learning
  - studying the components of learning outcomes and their predictive capacity for future learning, employment and overall success.

5. The Framework

This framework constitutes an attempt to resolve a number of the issues raised and to suggest a model for the collection of data and research using that data for the study of child development and learning.

In this framework, learning is broadly rather than narrowly defined to include not only learning acquired in formal learning settings but also through life experiences and social interactions. Therefore, learning that occurs before school is the foundation for formal learning and continued self-directed informal learning. Learning outcomes include attitudes, learning potential (also called study skills or learning processes), the acquisition and application of knowledge. Learning is cumulative, with simpler constructs necessary for more complex ones. Learning must be pleasant and gratifying because success in early learning is essential for life long learning. Learning is individual and application even more so. Such diversity and creativity is increasingly valued as intellectual capital. Thus, learning assessments should not value conformity and standardisation over originality and inventiveness.

The focus of the research will be on the child and the way each child learns. But it is recognised that the development of the child is linked to learning. Therefore, learning outcomes must be studied in the child development context. In a foetus and new born, learning and child development are synonymous since the brain is wired then for a lifetime of learning. Connections between neurons in different areas of the brain mature at different times. As the child grows from infant to toddler to preschool age, various aspects of child development and learning can be distinguished. Pathways of motor, social, emotional and language skills development with milestones have been established. As the child grows, learning outcomes can be isolated from other domains of development. Physical, social and emotional development are essential but not sufficient conditions for learning. Since they are not a substitute for learning, learning outcomes must be measured on their own. In the school years, learning becomes diversified. Piaget describes physical knowledge, logico-mathematical knowledge and social-conventional knowledge. Gardner identifies seven "human intelligences" or ways people know the world - language, logical mathematical analysis, spatial representation, musical thinking, use of the body to solve problems or to make things, an understanding of other individuals and an understanding of ourselves. For these reasons, all aspects of learning must be examined in the

child development context, which can only roughly be approximated by age. Therefore, learning should be best studied as a continuum rather than as standards related to age.

Development commences before the child is born. The pace of development is very rapid in the early years. In fact, researchers have pointed out that single point-in-time measurement is difficult because development is not stable. Because development and learning are cumulative, it is necessary to study children starting at birth and continuing through childhood. However, the start of school is a major transition and, therefore, data also will be collected regarding 5 and 6 year olds. Development and learning will be monitored through the early years of school as well for a sub-sample of children.

Because of the importance of the early years for learning and the cumulative nature of development and learning, policy interventions must be directed before school entry for effectiveness. Data collected only at the time of school entry are insufficient. Comprehensive information about the trajectories and distribution of developmental achievement of preschoolers is important intelligence for schools so that they may prepare for the full spectrum of children. Research information should identify factors to make all children learners, wherever they may fall in their developmental trajectories. Furthermore, longitudinal research beyond school entry is required to test the predictive accuracy of learning outcomes and to evaluate the success of policy and program interventions. Therefore, data should be collected at five points: at ages one, three, five, seven and nine to allow the research and analysis to meet the policy objectives.

Applied Research Branch's framework for research on child development and learning is presented in the accompanying chart. The model consists of three parts: (1) what life experiences bring to the child, (2) what the child brings to learning, and (3) learning outcomes.

Framework for Research on Child Development and Learning

What Life Experiences Bring to the Child	What the Child Brings to Learning				Learning Outcomes		
	Physical health and motor development	Emotional health	Social knowledge and competence	Language skills	Cognitive development	Learning processes	General knowledge
Environment (community) Family (parents and siblings) Peers Preschool and School (including deficits)	*Physical health:* Growth Fitness Maturation Wellness/illness *Physical development:* Gross motor skills Fine motor skills Sensorimotor skills (including delays)	Emotional maturity Self confidence Curiosity and eagerness to try new experiences (including disorders)	*Social knowledge:* Respect for authority *Competence:* Self control Co-operative skills Socially acceptable behaviour (including difficulties)	Receptive skills Expressive skills Language comprehension (including delays and difficulties and defects)	Memory Numeracy and Math skills Logic Abstract/ representational thinking Imagination Creativity (including learning disabilities)	*Learning attitudes:* Openness to learning Task persistence *Meta-cognitive processes:* Seeking sources of information Sorting information Organising and analysing information Reflection and interpretation Sharing information *Learning potential:* Use of questions Comparisons, evaluations of options Cause and effect Problem solving Application to new/unrelated situations *Learning styles:* Aural, visual, text, action.	*General knowledge:* Knowledge of other people and the world as a foundation for historic, geographic, scientific and technical knowledge

Note: Age appropriate data will be collected at ages one, three, five, seven and nine.

6. Strategy

Applied Research Branch's strategy for research on children's development and learning is to develop global measures as well as specific measures of developmental domains and learning covering the ages from birth to nine. The instruments or questions must be age specific or cover all age groups but provide age specific information. They should permit analyses of relationships to determine risk and protective factors for learning outcomes. Measures should be sensitive enough to capture delays, difficulties or disabilities. Repeated applications should provide a picture of developmental and learning trajectories. Data will be collected from parents and teachers and a second interviewer will be available in the home for direct observation and assessment of the child.

According to Dr. Morrongiello, the NLSCY already includes scales or questions on some of the elements of development. However, it has very little coverage on learning outcomes. The evaluation of the existing data collected on the domains of development showed some inadequacies. Some age groups are better covered than others through tests or a series of questions. Two instruments used for young children are the Peabody Picture Vocabulary Test (PPVT) and the Motor and Social Developmental Scale (MSD). The PPVT, which is used for 4 to 6 year olds, is generally considered to be a good assessment of receptive language skills among young children. The MSD measures motor, social and cognitive development from birth to a maximum of three years of age, through parent report; NLSCY experience shows that it provides acceptable data on delayed motor development only. Parents are also asked a battery of questions on behaviour and temperament. There are individual questions or rating scales completed by teachers and parents on social and emotional development but these may not provide sufficient detail for analyses. The NLSCY contains a wide range of information on relationships with family and peers but is less complete with respect to environment or community.

New measures which may be added to the survey must work well with existing content. Some possibilities exist for modifications, however, since three cycles of data have been collected, dropping questions have consequences for longitudinal analysis. Decisions regarding instruments will be made on the basis of ease of collection, validity for tracking development and learning, and analytical value for money/time.

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